MAY 1952

660

Route this to:

CHEMICAL PROCESSING

The News Magazine of Processing Developments and Control

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The Cover Picture

Bagging "spent grain" resulting from beer-making process, prior to selling as cattle feed. To learn how tons of valuable by-product are recovered daily, turn to . . . . . Page 142

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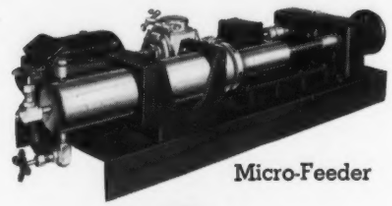

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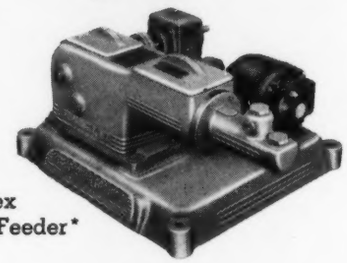

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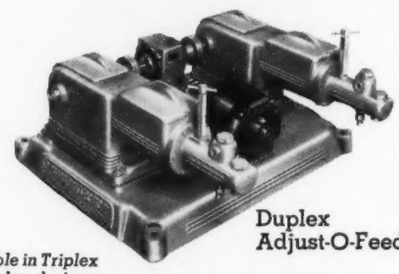

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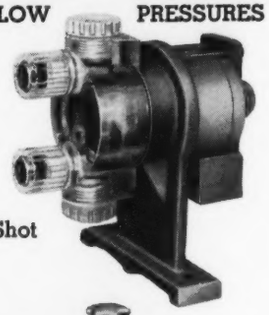

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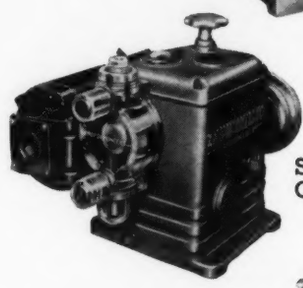

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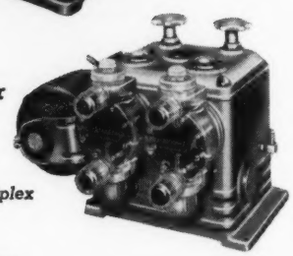

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"That's Interesting"

64-foot cross arms for new power line

Giant 64-foot wooden cross-arms are being used on a 230,000-volt power line from Union Electric Co.'s Cahokia plant to a $97,000,000 power project at Joppa, Ill. Ordinary cross arms are around 8 feet in length. To protect the mammoth cross arms, Pentachlorophenol (Monsanto Chemical Company product) will be forced into each one. About 6 lb of chemical is used for each cu ft of wood.

Pressure measuring device

Among 30 patents released for use late last year by the U. S. Atomic Energy Commission is one for an oscillation type pressure gage which is reliable and accurate up to a pressure value of the order of 20 microns. The improved characteristics of this gage are obtained by employing an annular anode and an annular cathode, annularly spaced from one another, so that an electronic discharge region of arcuate cross section is defined by the intervening space between the electrodes. This is identified as Patent 2,577,066, titled "Pressure Measuring Device." (United States Atomic Energy Commission, Washington 25.)

Synthetic earthquakes recorded by model seismograph

A model seismograph, installed recently in the museum at Hawaii National Park, Territory of Hawaii, gives visitors an opportunity to create and record synthetic earthquakes. The model works like a real seismograph, but tremors are produced by an electric motor.

Safety shoes keep feet — and minds easy

Modern safety shoes have their built-in protection handsomely encased in fine finished leather. Many styles are as attractive as could be desired for street wear. Large plants, such as those of Armco Steel, keep from 1000 to 1500 pairs in stock at all times. Low, high, and boot types are available in a variety of colors. Some are pull-over type so sparks cannot burn through the laces and get to the feet. Others have soles of acid- and oil-resisting material. (Armco Co-operator, Armco Steel Corp., Middletown, Pa.)

"Synthetic" amino acid formed in body

The discovery that a synthetic amino acid, hitherto unknown in normal biological systems, can be formed in the body, was recently reported by two scientists at the University of California. The synthetic acid is alpha aminobutyric acid. It is one of the scores of amino acids that chemists have synthesized in the laboratory, but which have not been found previously in normal body tissues.

For more information on product at left, specify CP 2232 . . . see information request blank between pages 2 and 3.

"That's Interesting"

Motorists may become large users of ion exchange resins

A miniature water softener that can fit under the hood of an automobile protects the cooling system against scale and corrosion. Utilizing ion exchange resins in a cartridge that lasts for approximately 6 months it treats water as it is bypassed from the main stream of the heater line. Cartridge is the heart of the exchanger. It is inserted in an outer sheet-metal container and consists of two functional elements: a mixture composed of 2 oz of Amberlite IR-120 cation exchange resin and a corrosion inhibitor. These are sealed in a polyethylene-treated cloth sack. Shell of cartridge is molded from phenolic-impregnated paper. Water, entering the unit at top, flows into the sack containing the exchanger-inhibitor mixture.

For buffering purposes, the inhibitor, sodium mercaptobenzothiozole, is combined with sodium nitrate. Resin is dried to well below a 30% moisture content to facilitate uniform mixing with the inhibitor.

When water enters top of unit, it flows into sack containing the exchanger-inhibitor mixture. Flow through is 24 quarts per hour at road speeds of 30-40 mph. The Amberlite resin is compatible with anti-freeze materials. Four million lb of resin would be required annually for replacement of cartridges, if units were installed on 30% of the nation's 55,000,000 vehicles and tractors. Resins are produced by Rohm & Haas. Unit is manufactured by Fram Corp., Providence, R. I.

Really a deep freeze

In a large building being used for quick freezing and storage, low temperatures used on ground floor rooms traveled down supporting columns. A solid block of ice, 8 feet thick, was formed beneath the floor. This caused movement of as much as 8 inches in some parts of the building. By installing heating cable and insulation on floors and around columns and maintaining a heating cycle, building was saved. (Ohmite News)

Commercial production of .0017-inch calendered unsupported vinyl film

For the first time, 1.7-gage calendered unsupported vinyl film is being produced on a commercial scale. The manufacturer, Ross & Roberts, Inc., Stratford, Conn., in producing this film by means of new techniques, uses a Farrel-Birmingham Z-type calender. Variation in film gage is less than plus or minus .0001 inch.

In the Z-type calender, rolls are arranged in pairs, mounted in precision sleeve bearings, and positioned hydraulically in direction of the separating forces. With only two rolls in any plane, there is no floating roll, so that the final gage is not affected by variations in size of previous banks.

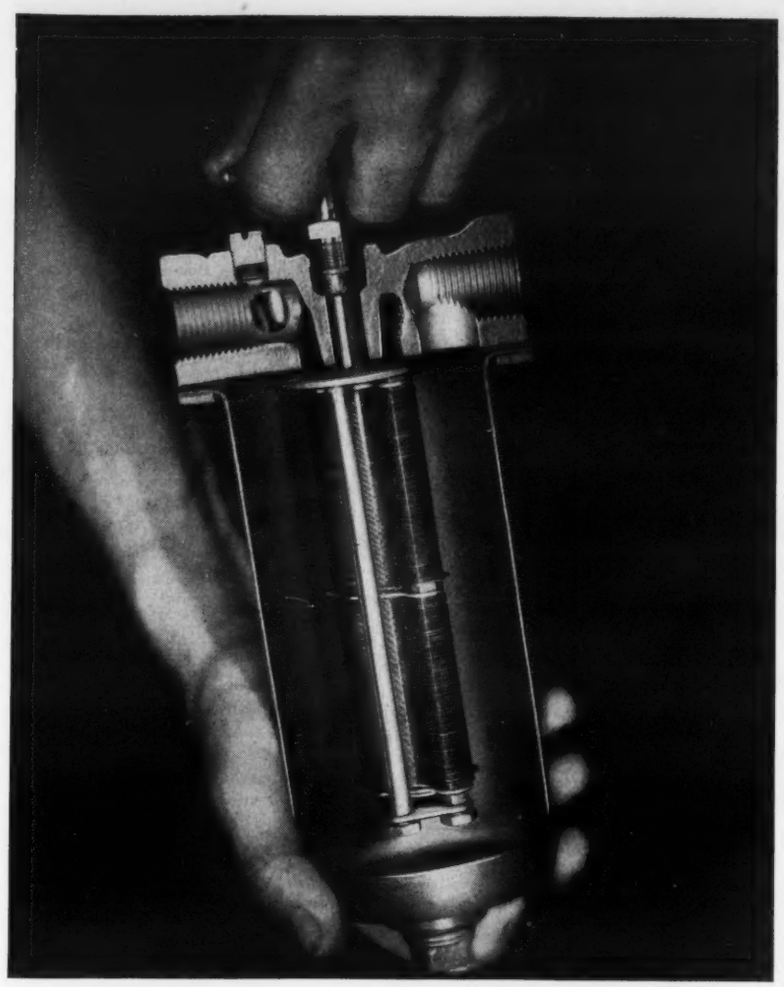
The calender has crossed-axes device which develops effect of crown on rolls and provides adjustment for changes in roll deflection. A push-button control makes adjustment that compensates for differences in separating force caused by variation in in stock composition, gage, and speed. Present-day development of the crossed-axes device makes it effective over a range of gages. For film production, one pair of rolls is equipped with the device for final pass. (Farrel-Birmingham Co., Inc., Ansonia, Conn.)

Speaker can operate this projector himself, right on platform

Speakers may now avail themselves of a film projector which also provides the advantages of a blackboard. An additional feature is that speaker can avoid turning his back on his audience. He can stand at the projector, which is placed at his side on the platform, and operate it as he talks. The machine projects upon a screen a transparency or slide prepared from drawings, sketches or, in fact, any copy. These are placed beneath a wide, movable transparent tape which provides a "blackboard" upon which speaker may write notes while facing his audience or use a pencil as a pointer.

As images projected are of great clarity and brilliance, it is unnecessary to darken the room under ordinary conditions. (Beseler Lantern Slide Co., Inc., 200 East 23rd St., New York 10, N. Y.)

(*Continued on third cover*)



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Cuno AUTO-KLEAN is the *only* fluid strainer with "comb-action cleaning" which permits it to work uninterruptedly. Dirt accumulations are dislodged *while* the straining goes on. This can be done automatically. *Guaranteed* to remove 100% of all solids larger than specified.

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Clean raw water, recirculating water, etc.—FLO-KLEAN

"Non-Stop" Fluid Cleaning Saves Time, Protects Quality

Many chemical plants have welcomed the Cuno AUTO-KLEAN strainer as a means of eliminating the problem of periodically cleaning or replacing a fluid cleaner.

The AUTO-KLEAN does not have to be dismounted or taken apart for cleaning, and it has no replaceable element. Hence, no need to shut down the equipment, no risk of exposing the product to contamination or the operator to harmful fluids or fumes.

The Cuno AUTO-KLEAN is continuously cleanable. The rotation of its all-metal discs against cleaner blades combs out accumulated solids which fall to the bottom for removal whenever convenient.

Never does process have to halt for sake of the strainer.

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Cuno AUTO-KLEAN can be made in a wide range of materials to handle a wide range of fluids, viscosities, temperatures and solids. It is 100% permanent. The element is non-collapsible. It will last as long as the equipment on which it is installed.

Models are available for straining from .0035 to .062 in. Sizes to handle from a few to more than 4000 gpm.

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(process)

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When inquiring check CP 2235 on handy form, pgs. 2-3

Methods of Training Supervisors

This editorial has been written at the request of the editors of CHEMICAL PROCESSING . . . and is authored by

MR. LOUIS A. ALLEN
Manager of Personnel Administration and Training, Koppers Company, Inc.

Graduated from Washington State College, where he did advanced work in education and psychology as well as taught and counselled students.

Assisted in development of company-wide training program for Aluminum Company of America. Received Legion of Merit for his work in developing personnel programs during World War II.

He is presently responsible for programs in personnel administration and training at Koppers Company, Inc.

Author of several manuals on personnel and training subjects, and has written widely for trade and professional publications.

PERHAPS one of the most surprising things in American industry during the past decade has been a recognition of the importance of management manpower in business. Not long ago the great shortages that plagued the executive were technological in nature. Only lately has management become fully aware that it is suffering from a dearth of manpower within its own ranks. This shortage is critical. It has become the limiting factor to profitable production in many companies.

With a sizeable percentage of recent college graduates being drained off to the armed forces each year, the picture promises to become even less promising during the next ten years. The handwriting on the wall is clear: any business that is to stay healthy must assure itself of a continuing supply of effective management people. Since the outside sources of supply are rapidly drying up, the companies most successful in meeting their management manpower requirements will be those which are most successful in getting the best out of people they already have.

The necessity for internal development of management talent is one reason why training has become increasingly important during the past few years. Today, many training programs are being dispensed and purchased in package form. Some of these are as meaty as research and the technical libraries can make them. But in spite of their authentic appearance, in spite of the careful editing of their vocabularies that makes them no more difficult to read than comic books, they still have a counterfeit air about them. The really successful training program cannot be superimposed on the management group. Successful training must grow out of the needs of the organization. It must be compounded of the thinking and mistakes of the people who are using it as a tool in their own development. Training withers on the vine unless it has deep roots within the organization to draw life blood of interest and participation.

There are certain training techniques which may be utilized to train those coming up through the ranks, and these same standards may be applied to those already filling supervisory positions. There is general agreement that over 80% of the supervisor's job lies in working with people. This means people who report to him, his fellow supervisors, and his boss. On attitude surveys, we find that non-supervisors almost invariably single out the supervisor's inability to handle people as his chief shortcoming. On performance reviews, superiors generally characterize this same area as being the significant supervisory weakness.

(*Continued on page 205*)

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(CHEMICAL PROCESSING PREVIEW)

The News Magazine of

Processing Developments and Control

Vol. 15 MAY, 1952 No. 5

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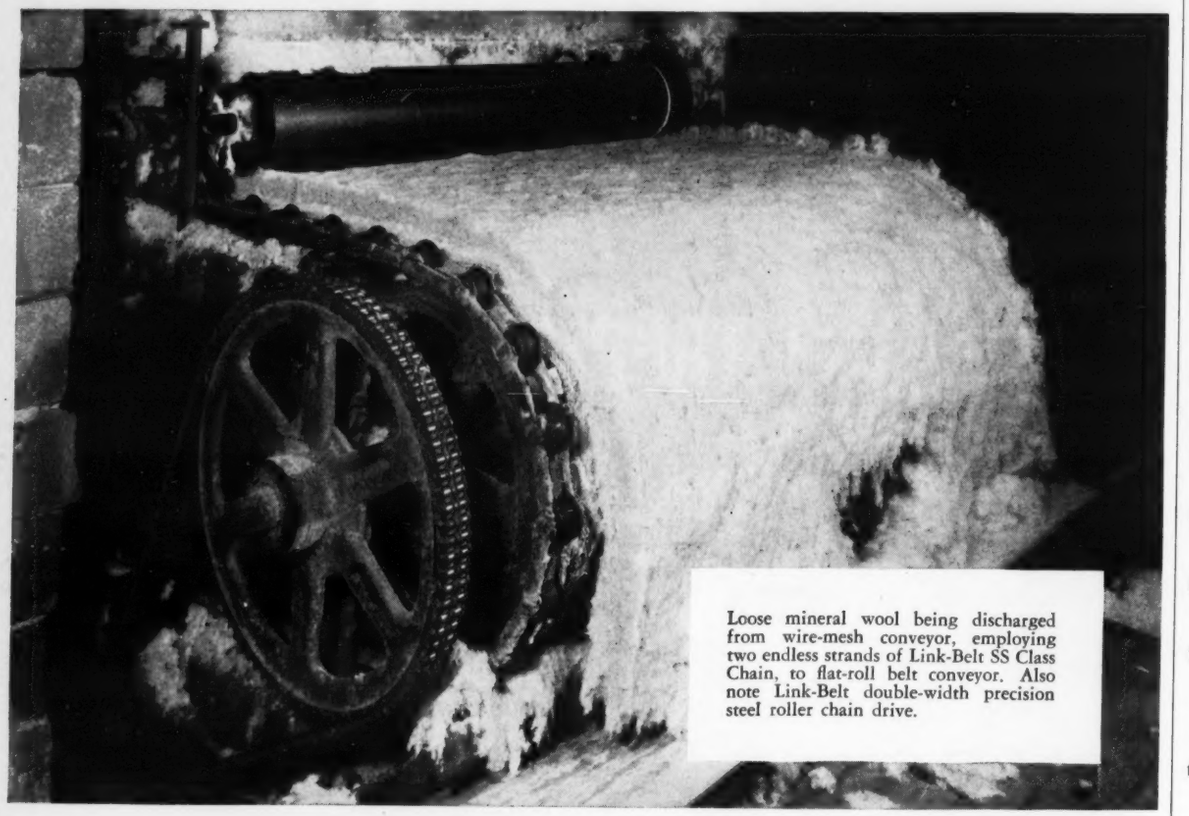

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CHAINS AND SPROCKETS

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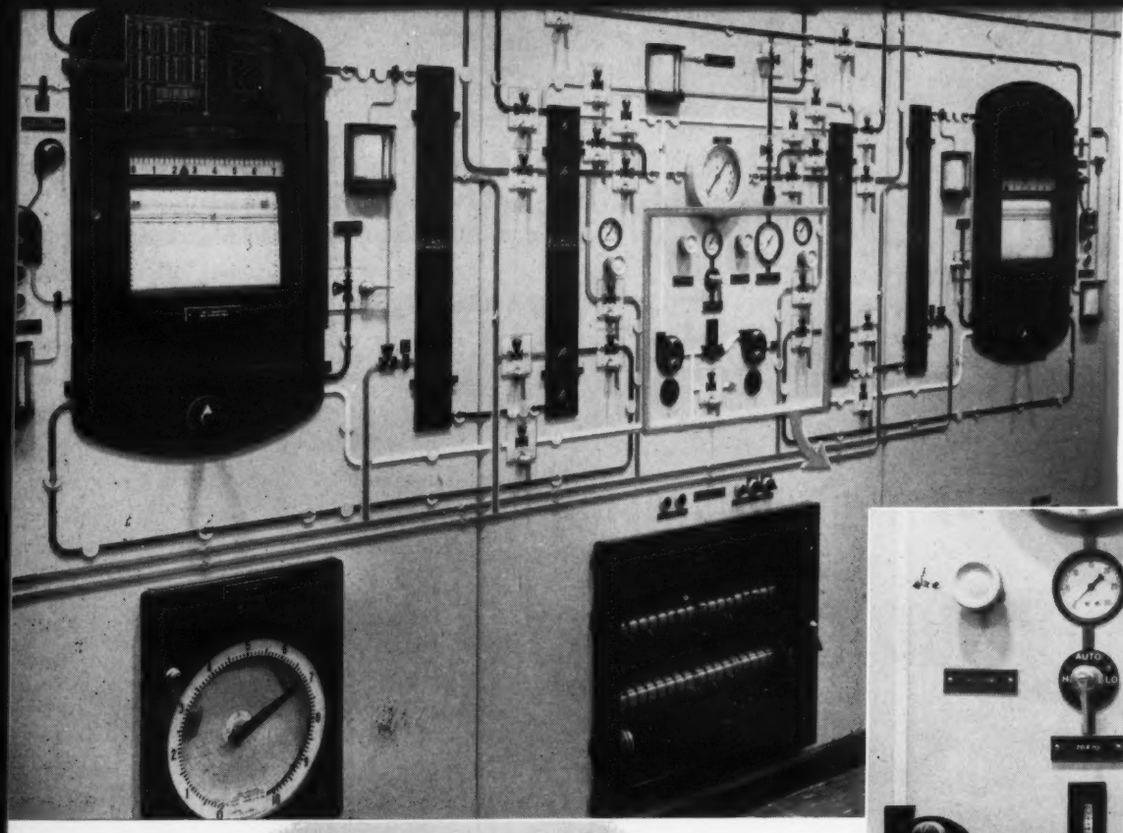
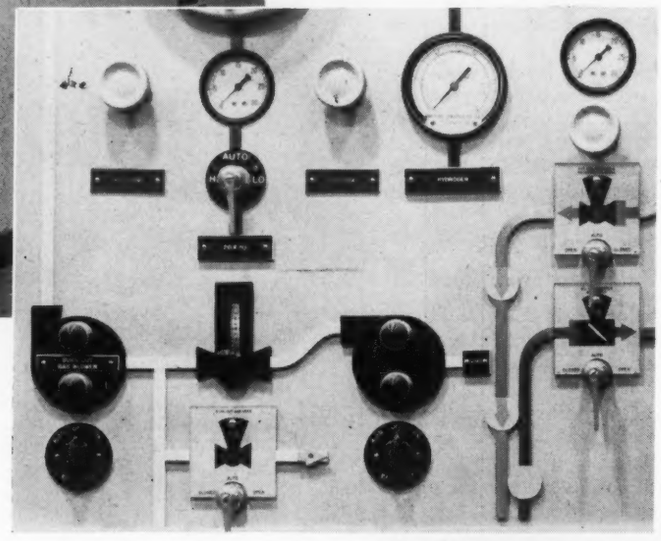
In Canada: North American Cyanamid Limited, Toronto and Montreal

When inquiring check CP 2239 on handy form, pgs. 2-3



Central portion of control board showing sequence controller, illuminated directional arrows, remote manual switches, etc



Closeup of air switches for remote manual operation of process valves

"Kinegraphic" Panel Depicts Process in Motion — Gives Operator Better Comprehension for Safety

John E. Read and John Johnston, Jr., Du Pont engineers, feel that this type of instrumentation has a real future in complex operations

OPERATIONS of one Du Pont nylon intermediates plant call for a complex switching of incompatible fluids through two converters. Temperature of highly corrosive processing material is better than 1000°F. Under the original design, flow routes were to be changed by closing large valves, bolting on blind flanges, and re-opening valves to permit diverted flow. Although this operation would have taken about 15 hours it was accepted as the penalty for operating an otherwise dangerous process.

First attempt to simplify process control came with the adoption of bonnet purged, split-wedge gate valves to replace the blind flanges. Design permitted remote operation by pneumatic operators, also included a second pneumatic cylinder to deliver a powerful hammer blow in case of stickiness. With this means of remote control established, the problem of automatic process control was taken up.

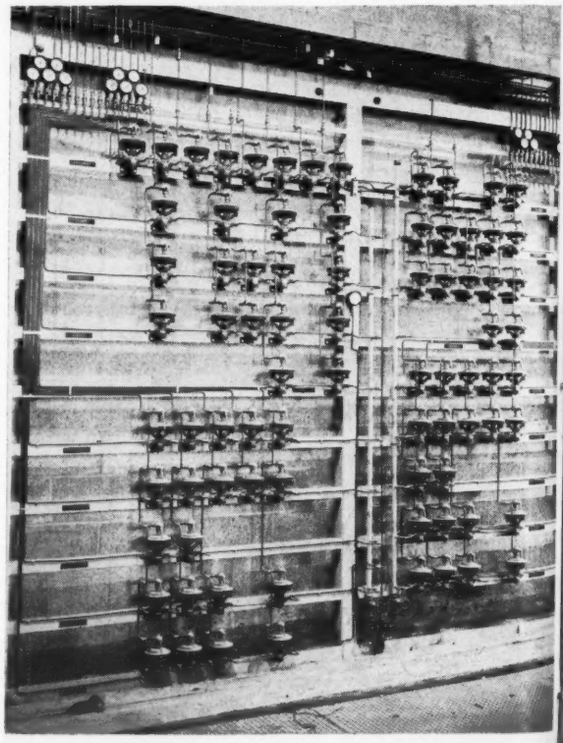
Two broad possibilities for automatic control existed. First, all operational responsibility could be taken from the human and placed in a hermetically sealed black box. Or second, operations could be automatic but with a qualified operator in supervisory control. Considering the potential danger of the process the "supervised" operation was the one which was chosen.

Process control system that emerged was designed for corrosion, and for trouble. It was designed to supply information about what was wrong with the process as well as what was right with it as operations progressed. In order to prevent any possible mishaps, 19 of the 28 process valves are interlocked — they can be operated only when other valves in the system are in a safe position.

Primary object of the instrument system, of course, is to keep operator informed about the process and process equipment. To do this, a panel described as "Kinegraphic" is used. At any time it shows the exact status of each important valve, kind of fluid flowing, and its direction of flow. An idea of its complexity can be had from the fact that there are two converters alternately on and off stream and each converter cycle consists of eight operating phases.

Secondary object of the instrument system is to keep operator informed about the functioning of the control equipment itself. And he can do a good deal of trouble shooting without leaving the control room. For instance he can check the sequence control, interlock pressure, purge pressure, and position of interlock valves. Major interlock components, too, are visible and are accessible to him in a special mounting rack. This design was drawn up with the idea of letting the operator see enough of the control equipment to get a good idea of

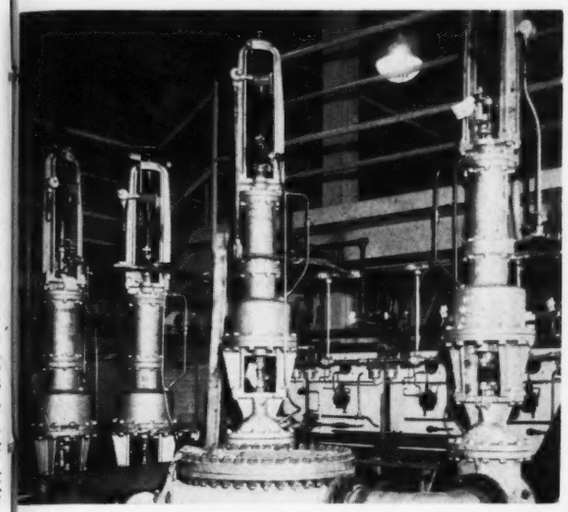
Interlock valves insure safe operational sequence of 19 process valves



how it worked. At the same time, trouble shooting has been kept simple enough to encourage him to learn and to give him confidence in the equipment.

There are some aspects of the operation which are not readily susceptible to automatic control. At these points the sequencer stops and sounds an alarm. Operator then takes over manual control. Also, in cases where some component of the automatic system takes longer than its allowed time to operate, the alarm sounds and the process is stopped.

Pneumatic power is used throughout the system for controlling, electrical power for indicating. This com-



Air piston actuated process valves operated from central sequence control board

bination has proved highly successful and has been received enthusiastically by operating personnel. Time to change flow routes has been cut to the minimum.

Kinegraphic control is seen as an approach to simplicity and safety which will allow atuomatic control to be extended to still more complicated and hazardous chemical processes.

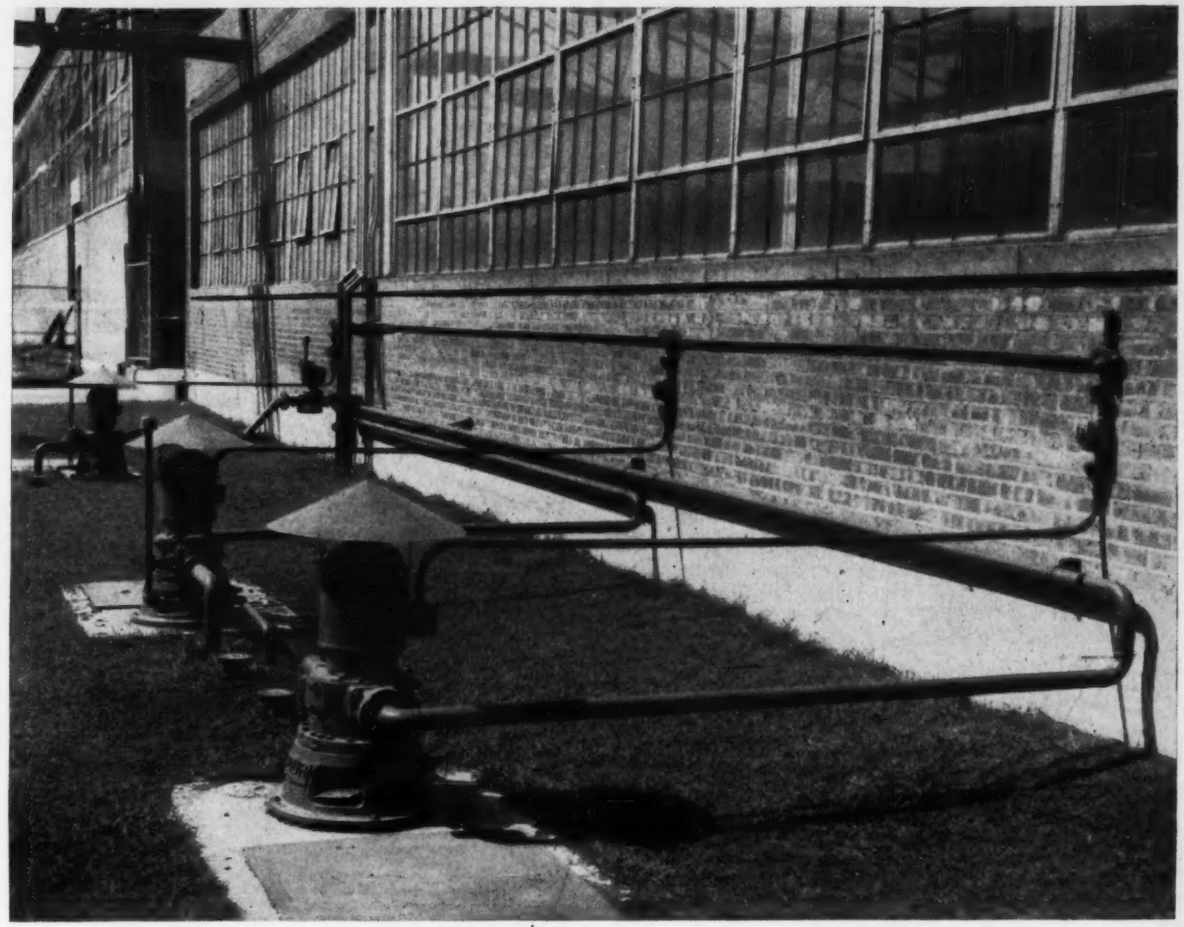
(Condensed from paper by John E. Read, Senior Instrument Engineer, and John Johnston, Jr., Instrument Consultant Supervisor, both of E. I. du Pont de Nemours and Co., Inc., Wilmington, Del. Equipment was furnished by Panellit, Inc., Dept. CP, 6312 N. Broadway, Chicago, Ill. . . . or for more information check CP 2240 on handy form, pages 2 and 3.)

Infrared analysis solves product control problems

Eight-page booklet reviews six case histories in which product control problems were solved through use of infrared analysis. Each case is outlined according to problem, solution, instrumentation, and discussion. Three problems covered are the detection of water in freon, quality control of inks and raw materials, and the control of insecticide products.

Other case histories deal with penicillin G assay, gamma isomer content of benzene hexachloride, and assay of chemically similar drugs.

Charts and graphs are included with various cases, as well as appropriate reference guides. "Product Control Through Infrared Analysis" is issued by The Perkin-Elmer Corporation, Dept. CP, Norwalk, Conn. When inquiring specify CP 2241 on handy form, pages 2 and 3.



Have you a tougher pumping job than this?

These pumps — regular La Bour Type BGM with the housings sealed and equipped with explosion-proof motors — are handling alcohol-acetone mixtures under a 13 foot suction lift and against an 85 foot head. The presence of this solvent would make packing lubrication extremely difficult — but all LaBour Type G pumps are packingless, so there's no problem at all.

The volatility of the alcohol-acetone solution demands a truly self-priming pump that cannot vapor bind—and of course that's LaBour. (Notice the sunshades to keep off hot rays which would induce greater vaporization.) The housings are sealed and vented through pipes and air-release valves on account of the fire hazard.

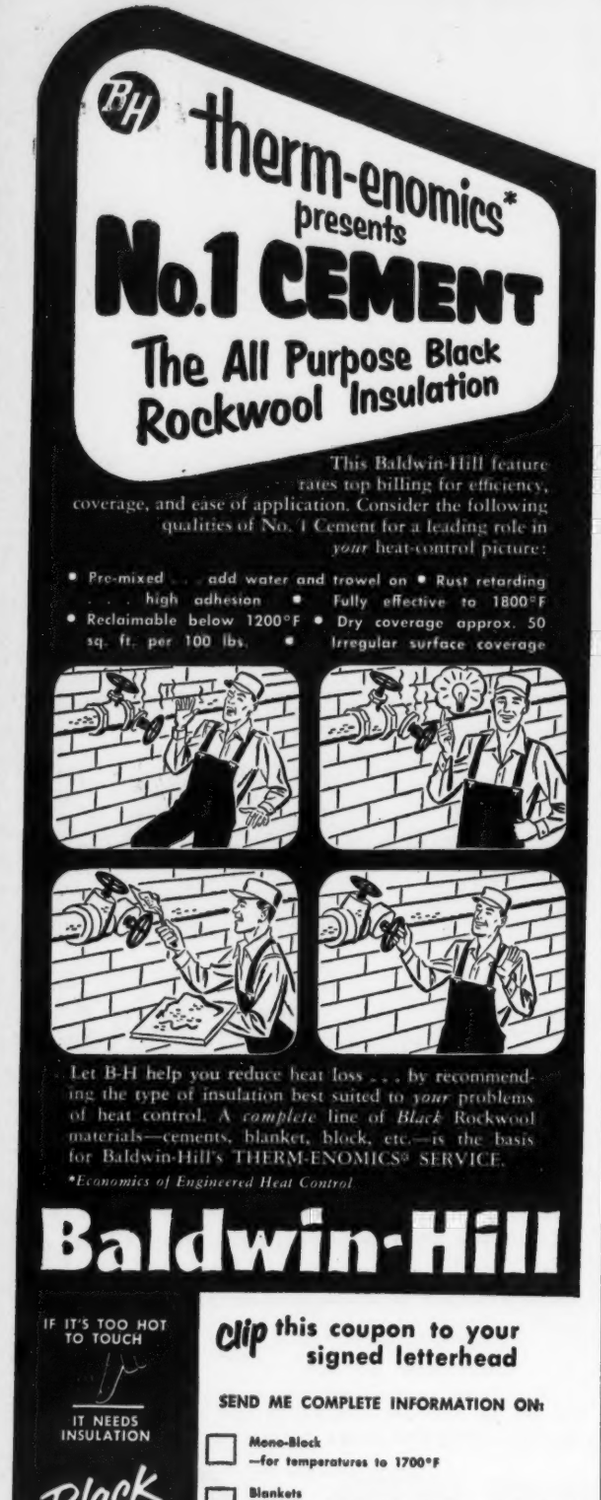
Here is another instance that proves LaBour pumps are the answer to the tough pumping jobs. That's why they can be counted on for *dependable* service on *any* job.

ORIGINAL MANUFACTURERS OF THE SELF-PRIMING CENTRIFUGAL PUMP

LABOUR

THE LABOUR COMPANY, INC. ★ Elkhart, Indiana, U.S.A.

When inquiring check CP 2242 on handy form, pgs. 2-3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This Baldwin-Hill feature rates top billing for efficiency, coverage, and ease of application. Consider the following qualities of No. 1 Cement for a leading role in your heat-control picture:
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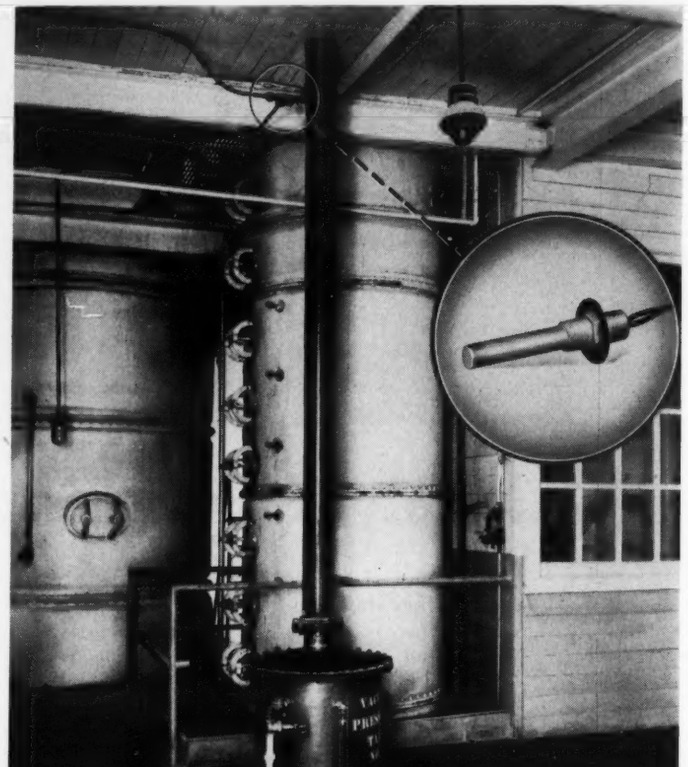
When inquiring check CP 2243 on handy form, pgs. 2-3

Seal Pot Venting System with Alarm Cuts Losses of Alcohol Vapor

Schenley distilleries find that fast-acting heat detector tells quickly when a seal pot on still blows



Explosion-proof detector actuates alarm when seal pot blows, venting alcohol vapor through duct to outside

PROBLEM: An explosion hazard used to exist in the distilling plants of Schenley Distillers, Inc., because the mechanical relief devices on the beer, whiskey, and alcohol stills were vented inside the building. Problem was partially solved by the use of seal pots (water-filled pressure-relief devices) that had a 6″ copper duct to carry any vapor outside when the pot blew. Needed was a way of letting the operator know quickly when a pot blew, so that he could minimize alcohol vapor losses.

Solution: The alarm system finally adopted represents a rather novel use of Detect-A-Fire units, which are usually employed as fire detection units. Here, they are installed in the ducts from the seal pots, and react to the hot vapors (about 220°F) that pass up the duct when still pressure reaches the set limit and the seal pot blows.

Actuation of a detector by escaping vapor closes a circuit which sounds a bell or siren, shorts out a green "safe-operation" light, illuminates a red "trouble" lamp, and operates a specific drop-tag on a control panel to tell which still is having the trouble. If the blown seal is the result of a temporary vapor surge in the still, the operator merely refills the seal pot with water; otherwise he shuts down the still until the trouble is found.

The detectors are inherently explosion-proof. Leads from each detector were enclosed in an explosion-proof connection box threaded directly onto the upper end of the detector. A special modification of the standard Detect-A-Fire assembly was provided so that a firm, leak-free mounting was assured in the thin duct wall. The units were assembled with a full coupling. Lower half of the coupling was threaded into a bushing in the duct wall, while upper part of the coupling, extending outside of the duct, provides mating threads for the connector box.

Results: Alcohol vapor losses are cut to a minimum, largely because of the high sensitivity and rapid response of the detector. The whole unit does not have to heat up to its set temperature before it reacts; as soon as the surrounding medium reaches the set-point, the detector will go to work. It functions consistently at or very near its preset operating temperature regardless of the rate of rise in the temperature of the surrounding medium.

(The Detect-A-Fire is made by Fenwal Incorporated, Dept. CP, Ashland, Mass. . . . or for more information check CP 2244 on handy form, pages 2 and 3.)

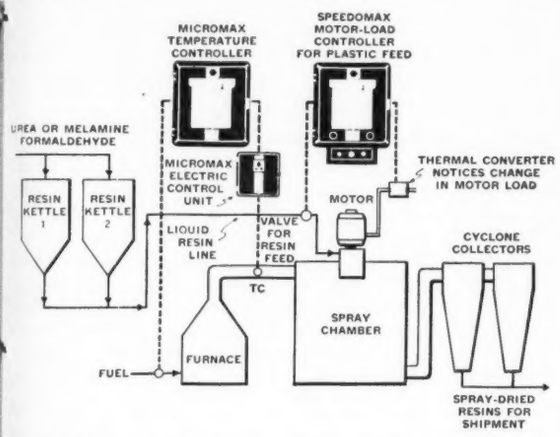
Now that feed is controlled, spray dryer turns out more with less labor

Control hinges on measuring true power used by motor of the drying unit

PROBLEM: American Cyanamid's modern Wallingford, Connecticut plant produces urea-formaldehyde and melamine-formaldehyde plastic molding powders. Process calls for making liquid-resin syrups in stainless kettles, feeding them to a spray dryer where moisture is evaporated and a fine powder is formed. Powder is collected in cyclones, blended, and bagged for shipment.

An operator, stationed at a control valve of the spray dryer, governed feed rate of the syrup manually. He adjusted it according to the reading of an ammeter in the power line of the spray unit's motor. Voltage and power factor variations played havoc with this scheme: it was almost impossible to duplicate feed rates, weights of resin produced had to be constantly checked, and raw materials were sometimes wasted in producing improperly polymerized resins.

Solution: When the plant installed a second spray drying unit, a Speedomax control system was installed



Schematic drawing shows how feed rate and temperature controls fit into process

with it. This control system also senses motor load, but with a thermal converter. Since it is based on power developed in a small resistor, this element senses only true power.

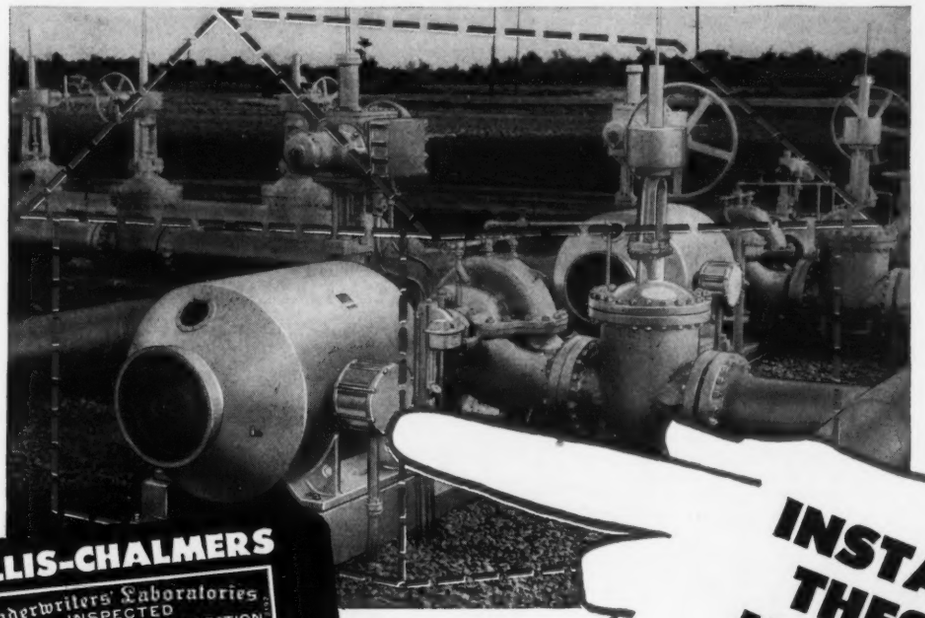
When the process is running smoothly, syrup is fed at a given rate and motor load is steady. Should feed rate increase, motor load increases too. This change is picked up by the controller which, in turn, re-positions feed valve pneumatically. In addition to controlling, the Speedomax produces a record of motor load.

In order to hold conditions constant, a temperature controller unit has been applied to the furnace which supplies hot gas for the dryer. This conventional equipment varies fuel input according to gas temperature at the dryer.

Results: Now the drying step does not need an operator to adjust feed rate. Since the Wallingford

(*Continued on next page*)

No building to buy!



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Tube-Type Motors

INSTALL THESE MOTORS OUTDOORS

YOU CAN ELIMINATE costly building on many different kinds of installations by using Allis-Chalmers tube-type, totally-enclosed, fan-cooled motors and installing them outdoors. The motors shown here operate outdoors all year round in a tough midwestern climate. Rain, snow, dirt, the weather's worst conditions, do not affect their dependable operation. And the same kind of savings can be made in hundreds of applications in many fields.

Self-Cleaning Feature Saves Maintenance

The cooling system in this unique motor is practically self-cleaning. Cooling air is blown through straight, smooth tubes at sufficient velocity to clean out ordinary dirt. There are no corners or pockets to trap dirt or moisture. If sticky dirt clings, a ramrod will clean the tubes in seconds.

In either indoor or outdoor service, Allis-Chalmers tube-type, totally-enclosed, fan-cooled motors reduce maintenance by keeping themselves clean. *Also available in explosion-proof design.* Get full details from your A-C Authorized Distributor or District Office. Or write Allis-Chalmers, Milwaukee 1, Wis., asking for bulletin 51B7149.

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PUMPS — Integral motor and coupled types from ¾ in. to 72 in. discharge and up.

When inquiring check CP 2245 on handy form, pgs. 2-3

Give your products built-in protection against mold and bacteria

Dowicide industrial germicides and fungicides protect the products and processes of many industries against microbial attack. Dowicide products—fourteen in all—are used widely in adhesives, sizes, wax emulsions, soluble-oil solutions, paints, and many other products. Check this list and see how Dowicide products can benefit you:

1. In textiles they protect sizing solutions from decomposition by bacterial attacks.
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3. In pulp and paper they protect lap stock from mold, increase felt life, and control slime.

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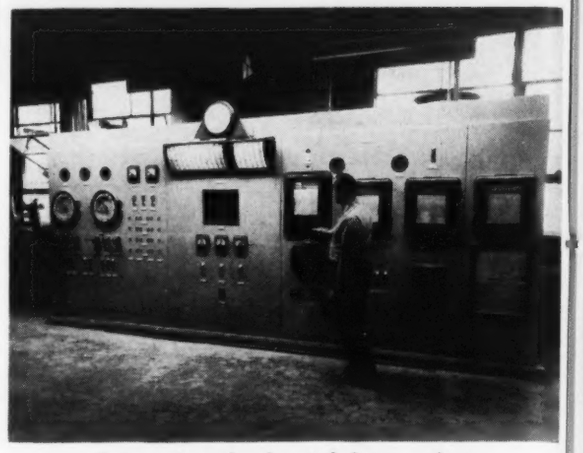
When inquiring check 2246 on handy form, pgs. 2-3

NEW SOLUTIONS of processing problems

(*Continued from preceding page*)
plant operates three shifts a day, it is estimated that the controller paid for itself (in labor savings alone) in a few months. But aside from that, throughput has been



Instrument panel and controls for spray dryer

increased and the product is uniformly satisfactory. In fact, control has been so close that motor load has never varied more than 0.2 kilowatt.

(Instruments were manufactured by Leeds & Northrup Company, Dept. CP, 4901 Stenton Ave., Philadelphia 44, Pa. . . . or for more information check CP 2247 on handy form, pages 2 and 3.)

Tells history and development of lead-clad steel and copper

Booklet reviews history and development to date of lead-clad metals in relation to problems of processing H_2SO_4, radioactive materials, and chromium plating. Lead cladding is chemically bonded to steel without using tin between the cladding and steel. Chemical bonding permits lead to expand with steel during temperature changes, thus resulting in high fatigue resistance. Pictures and sectional illustrations supplement the 26-page digest. Booklet points out use of lead-clad steel in temperatures to 500°F as medium with sulfuric acid, and as a barrier to harmful radiation.

Properties of sheet lead are compared to those of lead-clad steel. Characteristics of the two media are discussed as they relate to processing acids and chemicals. Comparison is also drawn between lead-clad copper and lead pipe. These metals are used in fabrication of heating and cooling coils to alter temperature of chemicals. Primary advantages of lead-coated copper are: withstands pressures to 200 psi; facilitates heat transfer; reduces thickness of piping.

Similar discussion outlines characteristics of lead-clad copper coils and tubing. Efficiency of copper to absorb and transfer heat is notable advantage. Chemical bonding of lead coating does not hinder heat transfer. Booklet concludes with description of lead-clad copper anode for use in chromium plating. Copper core is chemically bonded to lead coating. This utilizes high conductivity of copper without loss of current transfer between copper and lead. Anode incorporates capacity of lead to withstand electrochemical corrosion.

Booklet "History and Development of Ferrolum Lead-clad Steel and Cupralum Lead-clad Copper" is issued by Knapp Mills Inc., Dept. CP, 23-15 Borden Ave., Long Island City, N. Y. When inquiring specify CP 2248 on handy form, pages 2 and 3.

Thirty % higher output, best process control in "cold" GR-S . . .

laid to use of water-treating chemical in making latex

A thirty per cent increase in output of "cold" GR-S American rubber has been attained through a major improvement in the manufacturing process employed at the government-owned Port Neches, Texas, rubber plant.

The new process, without changing existing plant facilities, makes use of a tetra-sodium salt of ethylene diamine tetra-acetate which is added to the water used in making the latex. It forms complex compounds with the iron, calcium, and magnesium ions ordinarily found in water. Thus chelating these ions, it prevents them from behaving as inhibitors in the cold rubber polymerization system.

Using the salt, an exceptionally high degree of process control has been obtained, with higher reaction rates.

On the C-A reactor unit, which possesses the internal cooling coils in the last six reactors and where temperature control is very good, the process control is exceptionally good. A summary of reactor data on the C-A unit in a typical run follows:

Average ML-4'*	52.3
Daily ML-4' range, average	6 units
Average conversion, %	62.3
Daily conversion range, ave, %	3.8
Daily reaction time calc'd to 60% conversion, hr	12.2 ave 11.6-13.0 range

*Mooney rating.

No process control changes were required on unit for the first 8 days.

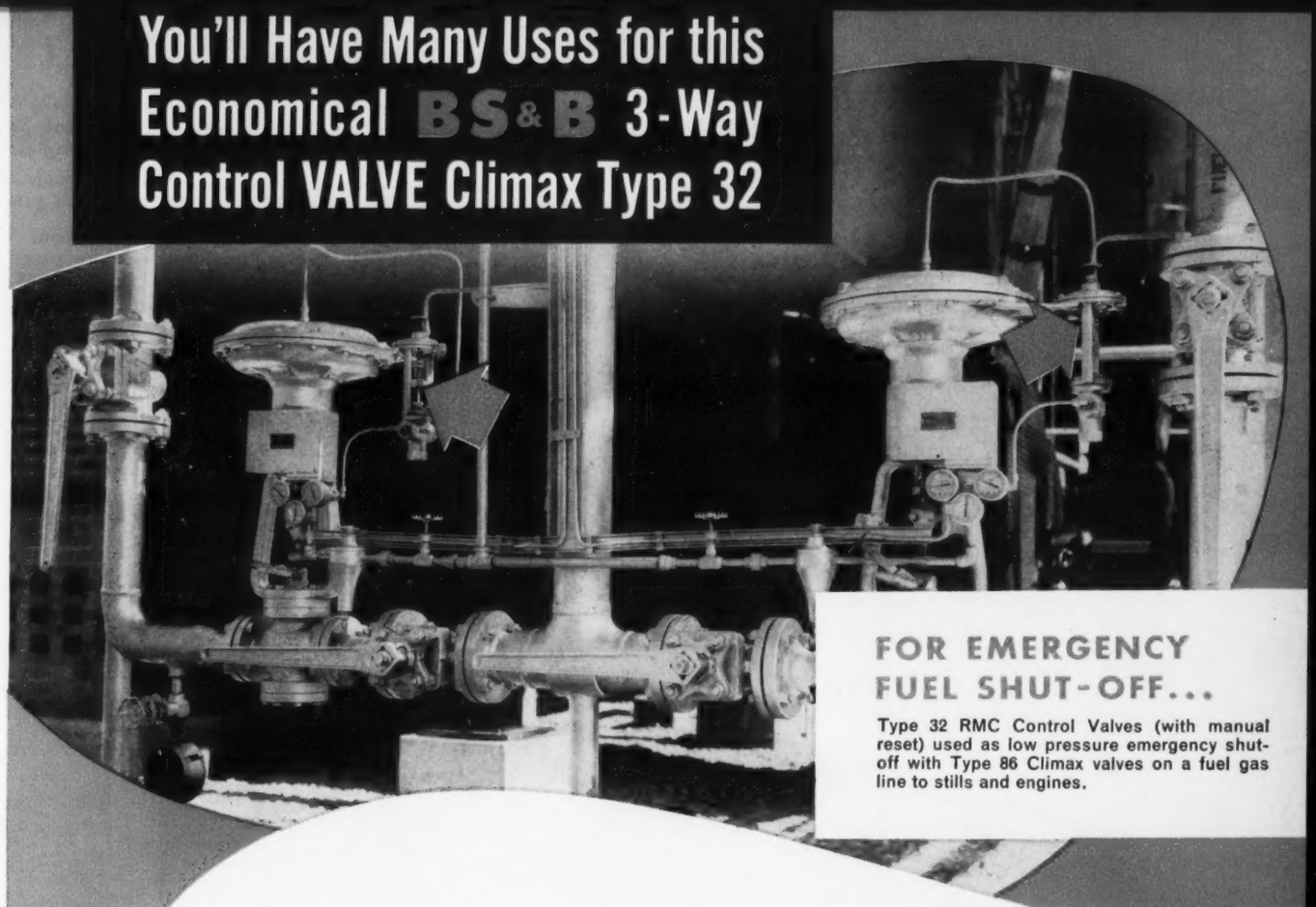
The use of the salt has made it possible to obtain reaction rates not previously realized. Without its use best rates were 13.0-13.5 hours with generous use of catalyst and activator. Rates now obtainable are 9-10 hours at 60% conversion, with attendant savings in catalyst and activator.

Goodrich reports that the overall cost of the rubber is lowered by a reduction in the amount of auxiliary chemicals used to promote the rubber-forming chemical reaction. In addition, the cold GR-S produced is appreciably more uniform in quality, and the process requires less exacting control.

(Summary of information received from the B. F. Goodrich Chemical Company, A Division of the B. F. Goodrich Company, Dept. CP, Rose Building, 2060 E. Ninth Street, Cleveland 15, Ohio.)

For more information on product at right, specify CP 2249 . . . see information request blank between pages 2-3.

You'll Have Many Uses for this Economical BS&B 3-Way Control VALVE Climax Type 32



FOR EMERGENCY FUEL SHUT-OFF...

Type 32 RMC Control Valves (with manual reset) used as low pressure emergency shut-off with Type 86 Climax valves on a fuel gas line to stills and engines.

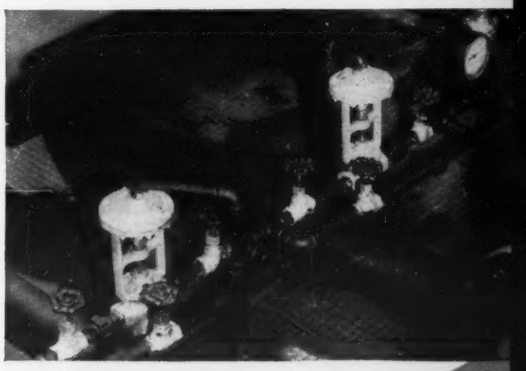
Designed for service with low differential pressure across the valve, having a small diaphragm area, Climax Type 32 Control Valve is both economical and versatile. As a three-way valve the spring holds the upper or horizontal ports closed when control medium is not applied to the diaphragm; as pressure is applied, the upper port opens for straight-through flow and the lower port closes.

To convert Type 32 to an inexpensive control or direct regulator it is only necessary to plug one of the valve outlets. Thus, with one horizontal outlet plugged (Type 32-D) with the bottom outlet plugged (Type 32-R). With these easy modifications you have, within their capacities, very efficient control valves, reducing regulators or back pressure valves. The Type 32 with hookup variations will serve many unique applications in safety shutdown systems or alarm signals.

The cast iron body, stainless steel inner valve and Neoprene diaphragm make Type 32 a rugged *and* versatile adjunct to your controls system.

FOR POWER CONTROL...

Climax Type 32-R valves used as automatic pressure controls to shut down pumps supplying low-pressure liquid-vapor separating vessel at over-pressure or pressure drop.



WRITE FOR Complete Literature on Type 32 and other Climax Diaphragm Control Valves. Ask for Catalog Section 105. Your nearest BS&B branch office has an expert on Climax Controls to assist you with your problems.

CLIMAX BS&B CONTROLS

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Climax Controls Division, Dept. 4-M5

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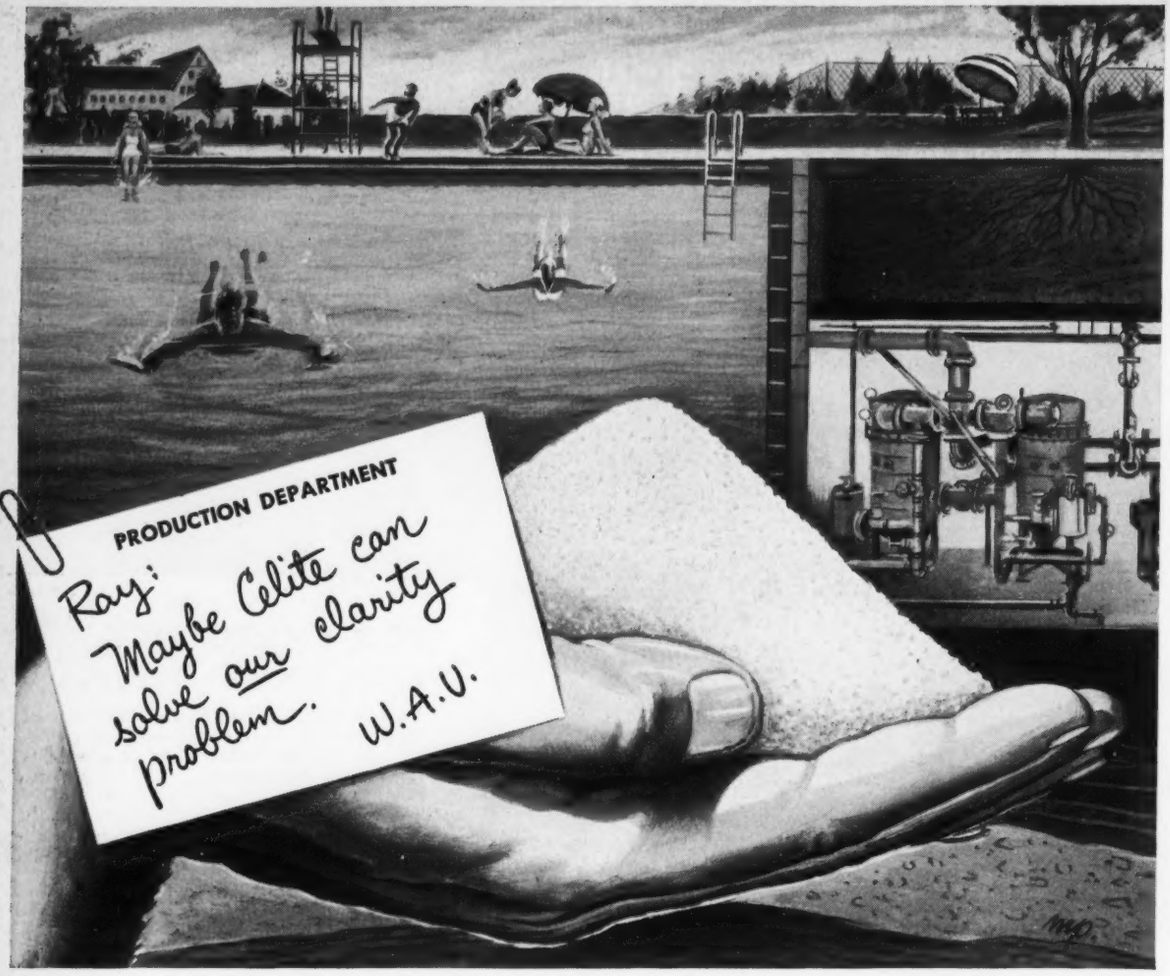


"Fresh-up powder" for busy pool water

To keep the water in their swimming pools constantly refreshed, many operators swear by the thorough cleansing action of Celite* filtration.

By removing algae, chlorine-resistant amoebae—and other suspended impurities—Celite Filter Powders provide an uninterrupted flow of clear, clean water. They also reduce the need for chemical treatment.

The effectiveness of Celite—in this and countless other operations—can be attributed to these important factors which make it unique among filter aids:

Carefully processed from a large and pure deposit of diatomaceous silica, Celite is available in several standard grades—each designed to trap suspended impurities of a given size and type. Whenever you reorder, you are assured of the same uniform, accurately graded powder received in your initial order. Thus, with Celite, you can count on consistent clarity and purity in your filtrates—at highest rate of flow—month after month, year after year.

Keeping swimming pool water constantly refreshed is one of many processes in which Celite provides vital clarity. The proper grade of this filter aid will assure you the same results—regardless of your product or process. To have a Celite Filtration Engineer study your problem and offer recommendations, write Johns-Manville, Box 60, NewYork 16, N. Y. *No cost or obligation.*

*Reg. U. S. Pat. Off.

JOHNS-MANVILLE JM PRODUCTS

Johns-Manville CELITE

FILTER AIDS

When inquiring check CP 2250 on handy form, pgs. 2-3

Corrosion-resisting cast iron coils are compact in oil recovery cooling process . . .

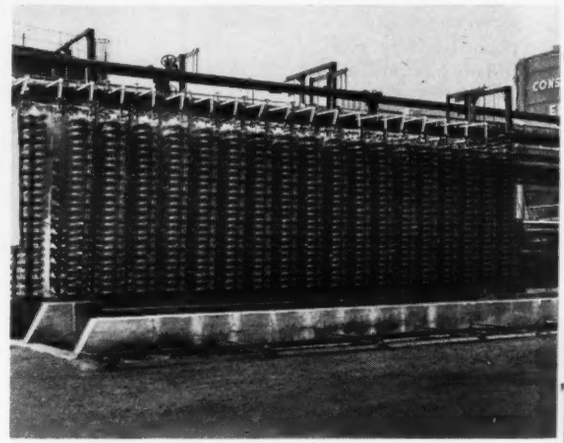
high heat transfer rate makes sections also effective in processing of coal gas

Problem: Both the Consolidated Edison Company coke plant at Hunts Point, New York City, and the Everett, Mass., plant of Eastern Gas and Fuel Associates, had been equipped with steel pipe coils for the cooling of light oil recovery in the production of coke.

At Hunts Point, average life on the hot end of the wash oil coolers was about two years, while at the Everett coke plant the galvanized steel pipe coils used for cooling ammonia liquor with sea water from Boston Harbor lasted 18 or 20 months and required constant attention because of leaks resulting from corrosion.

Furthermore, the wash oil cooler at the Everett plant, a single-stage cooler, was not large enough to provide final oil temperature in the summer. To obtain an additional 15° of cooling would require 50 per cent more surface with the same type cooling equipment.

Solution: Progressive replacement of the steel pipe coil cooling equipment was made with gray cast iron cooling sections by both companies, following an experimental installation of a single bank of these sections in each plant in 1946-47. As a result of the 1946



Approximately one-third of the original catch basin area is now required for the wash oil cooler unit of Hunts Point plant of Consolidated Edison Company. This unit takes 6000 gph of wash oil and reduces its temperature from 150-160°F to 85-90°F in summer operation

experiment, the entire cooler at Hunts Point was changed over during an 18-month period in 1948-49 as a maintenance operation.

This wash cooler now consists of 19 stacks, each 24 sections high. Each stack replaced a bank of pipe coils consisting of forty 20-feet lengths of 2" pipe. The section coolers now occupy less than one third of the space formerly used by the pipe cooler. The Ammonia liquor coolers are also being converted from pipe coils.

At the Everett coke plant a program of replacing 50 banks of pipe coils with the cast iron sections was begun in 1950. Each bank consists of two series of stacks 15 sections high, and is designed to cool 45 gpm of ammonia liquor from 120°F to 85°F with 56 gpm of raw,

For more information on product advertised at right, specify CP 2251 . . . see information request blank between pages 2 and 3.

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Controlled Quality

PIPE FITTINGS

reduce piping assembly time

Makeup goes smoother... with less chance for delay... on those piping systems where Ladish fittings are installed. Ladish Controlled Quality makes the difference. By exacting controls over materials and manufacturing processes... Controlled Quality assures uniform weldability through metallurgical integrity, fast assembly through dimensional accuracy and provides a real assurance of ultimate operating economy and complete dependability... reasons why it pays to specify LADISH.

TO MARK PROGRESS

THE COMPLETE *Controlled Quality* FITTINGS LINE
PRODUCED UNDER ONE ROOF...ONE RESPONSIBILITY

LADISH CO.

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Ever since you were knee-high to a hop-toad, you've heard about America's wonderful *natural resources*—the bountiful fertile fields, the towering timber growth, the boundless water power, and the untold wealth of gold, iron, oil, silver, coal and other natural treasures that lie buried in the ground.

Is it because America has *more* natural resources than any other country that Americans enjoy the world's highest standard of living? No—many countries have as much—some have more.

Then is it because Americans *do* more with what they've got?

Yes! And the reason is as plain as the nose on your face. It's because Americans are free to develop their natural resources—and their natural resourcefulness—in the wholesome climate of *open and strenuous COMPETITION.*

COMPETITION—not "regimentation"—is what eggs a man on to do his best.

COMPETITION—not government control—is what urges a business to give its customers ever greater value for their money.

So let's say "NO SALE" to the *ism* peddlers who would have us swap our U. S. A. system of free competition for their "planned" regimentation—trade our U. S. A. freedom and plenty for their serfdom and poverty!

* * *

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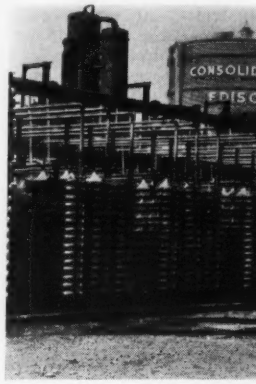
THE COMPETITIVE SYSTEM DELIVERS THE MOST TO THE GREATEST NUMBER

untreated sea water at
temperature at 35-36°F,
oil cooler at the same pl
of cast iron coils of 15
installed at one end of th
29,000 gph of wash oil
59°F sea water.

Results: Both compa
leakage of contaminatin
and a higher efficiency



Ammonia liquor cooler
includes 30 banks of gra
sisting of 90 stacks, 15
completed, the new cooli
more of

the present units are mo
before the new installati
cellent corrosion resistance
reported.

(Information courtesy of
National Radiator Compa
. . . or for more informa
form, pages 2 and 3.)

Annual instrumentatio
is set for June 2, 3, an
at Texas A&M . . .

seminar course will
control of process vari

A three-day symposium on
Industries" has been schedu
Texas A & M College at

Now in its seventh year,
strike a balance between t
and will include subjects
control of process variable
velopments and current t
will be conducted as a sem
discussions of various phas
mentation for the benefit
operating engineers, and m

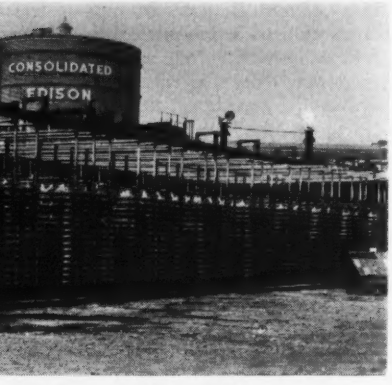
Held in cooperation with
of the Southwest, the m
manufacturers of instrumen

Additional information, in
be obtained from Profess
Engineering Department,
Station, Texas.

(Notice supplied by Minne
Dept. CP, 2707 Tayor St.,

ater at 74°F. In winter, with water 6-36°F, flow rate is reduced. The wash same plant was converted with a bank s of 15 stacks, each 21 sections high, nd of the original catch basin. It cools ash oil from 99°F to 77°F when using

companies report the elimination of minating fluids into the cooling water iciency of heat transfer. In addition,



cooler at the Hunts Point plant now s of gray cast iron cooling sections con- acks, 15 high. With half the conversion new cooling sections take 60 per cent or more of the cooling load

are more compact than the ones used nstallation. Easy maintenance and ex- esistance to the sea water used are also

rtesy of Heat Transfer Division, The Company, Dept. CP, Johnstown, Pa. information check CP 2252 on handy ad 3.)

ntation symposium , 3, and 4

. . .

e will evaluate new developments in cess variables

sium on "Instrumentation for the Process n scheduled for June 2, 3, and 4, by the lege at College Station, Texas.

h year, the symposium is designed to etween theory and practical experience, ubjects related to the measurement and variables, with recognition of new de- urrent trends in the industry. Course as a seminar, with lectures leading into us phases of the field of process instru- benefit of instrument, process design, , and management executives.

n with many important industrial firms the meeting is jointly sponsored by strument and control equipment.

tion, including a program folder, may Professor P. G. Murdoch, Chemical cment, Texas A & M College, College

Minneapolis-Honeywell Regulator Co., ayor St., Dallas 1, Texas.)

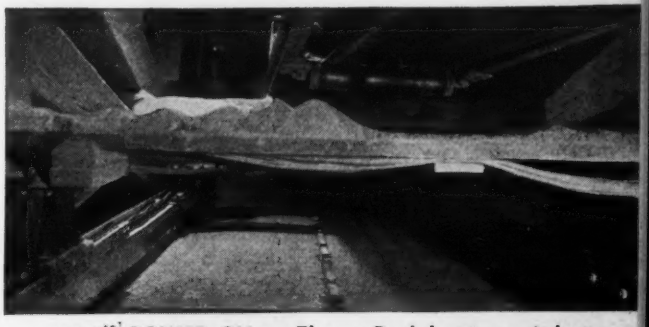
NOW... SCREEN FINE, MOIST MATERIALS Without Blinding!

ALLIS-CHALMERS
THERMO-DECK
Heating Unit

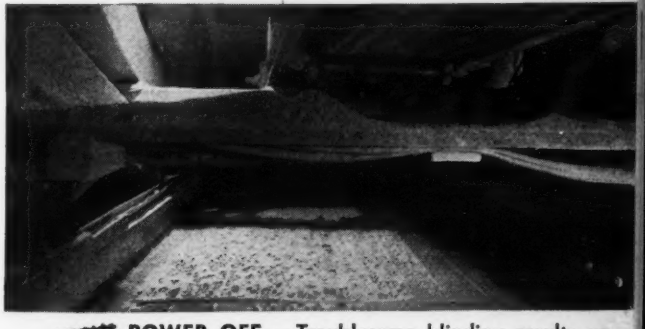
NO "TIME OUT" to clear fine or medium mesh screen cloth! You can screen fine, moist non-combustible materials *continuously* with new *Thermo-Deck* heating unit.

INCREASED CAPACITY! Heated screen cloth *remains* open, permitting more tonnage through the screen and better separation.

LOWER COSTS! Operating records show that heated screen cloth lasts up to three times as long when cloth does not have to be pounded free of blinding material. The *Thermo-Deck* heating unit can be easily applied in the field. Your nearby A-C representative can give you more details. Allis-Chalmers, Milwaukee 1, Wisconsin.



POWER ON — *Thermo-Deck* heating unit keeps screen cloth clear on screen handling fine, moist material.



POWER OFF — Troublesome blinding results on same screen when *Thermo-Deck* heating unit is turned off.

Send for...

New 8-page bulletin containing complete facts on operation and application of the *Thermo-Deck* heating unit.

Bulletin 07B7812

A-3619

Thermo-Deck is an Allis-Chalmers trademark.

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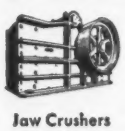
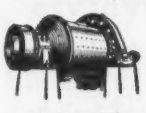
Sales Offices in Principal Cities in the U. S. A. Distributors Throughout the World.

Pulverator


Jaw Crushers

Gyratory Crushers


Grinding Mills

Vibrating Screens

Kilns, Coolers, Dry

When inquiring check CP 2253 on handy form, pgs. 2-3

PUTTING IT ON THE LINE...

in Industry after Industry!

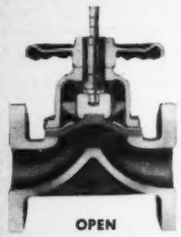
The Grinnell-Saunders Diaphragm Valve . . . . . .

Here's why . . . Piping in today's complex industrial plants is an exacting science involving the handling of highly corrosive fluids, gases, compressed air, beverages, foods and suspended solids . . . in lines where corrosion, abrasion, contamination, clogging, leakage and maintenance are costly factors. Under such conditions, the amazing adaptability of the Grinnell-Saunders Diaphragm Valve explains its acceptance by industry after industry.

Bodies of this versatile valve are made in a variety of metals — iron, stainless steel, bronze, aluminum and others. *But of more importance* is the fact that a body of cast iron (a metal not in short supply) can be lined with glass, lead, natural rubber, neoprene and other materials which, in many instances, handle corrosive fluids *better* than metals.

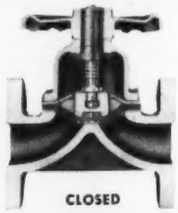
Diaphragms come in natural rubber, neoprene, butyl, hycar, a special synthetic for foods, and KEL-F. This last is chemically inert to all acids and alkalies in all concentrations with the exception of molten alkali metals.

From this broad selection of materials, the problems which the Grinnell-Saunders valve can solve are extremely varied. No wonder industry after industry is putting it on the line.



OPEN

Showing rising spindle . . . valves are available with rising or stationary spindle.

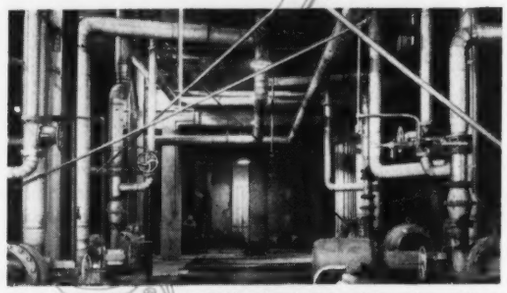


CLOSED

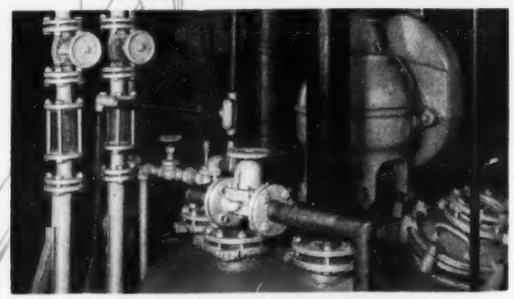
KEL-F diaphragm, using special rubber backing cushion and floating tube nut design.

CHECK THESE GRINNELL-SAUNDERS FEATURES...

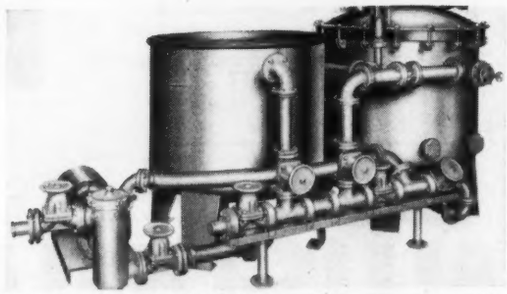
- Diaphragm absolutely isolates working parts from the fluid.
- Diaphragm lifts high for streamline flow in either direction.
- Diaphragm presses tight for positive closure.
- Body, lining and diaphragm materials to suit service.
- Simple maintenance — diaphragm easily replaced.



PULP AND PAPER MILL. Rubber-lined Grinnell-Saunders Valves on stainless steel piping handle sulphate pulp stock in bleach plant of Potlatch Forests, Inc., Lewiston, Idaho.



CHEMICAL PLANTS. Glass-lined Grinnell-Saunders Diaphragm Valves, with KEL-F diaphragms, handle chlorinated organic chemicals at Hooker Electrochemical Company, Niagara Falls, N. Y.



EQUIPMENT MANUFACTURERS. Grinnell-Saunders valves with rubber linings are standard on filtration equipment for solution clarification, made by Industrial Filter & Pump Mfg. Co., Chicago, Ill.

GRINNELL

WHENEVER PIPING IS INVOLVED

Grinnell Company Inc., Providence, Rhode Island • Sales Offices and Warehouses In Principal Cities

pipe and tube fittings • welding fittings • engineered pipe hangers and supports • Thermolier unit heaters • valves
Grinnell-Saunders diaphragm valves • pipe • prefabricated piping • plumbing and heating specialties • water works supplies
industrial supplies • Grinnell automatic sprinkler fire protection systems • Amco air conditioning systems

When inquiring check CP 2254 on handy form, pgs. 2-3

Fat extraction system can use several kinds of solvents and many charge stocks . . .

can be designed for batch or continuous operation; fat yield is high, no protein lost

Flexibility is the keynote of a recently developed process that extracts fat and water from packing-house by-products, fish wastes, and similar materials, and delivers products such as high-quality fat, high-protein meal, feed supplements, and starting materials for pharmaceutical preparations. Almost all types of fatty materials can be successfully treated with this process, and several types of solvent can be employed, as long as they are immiscible with water. (trichlorethylene, ethylene dichloride, propylene dichloride, and heptane are named as typical).

Thus, a plant built to handle a seasonal product can work with others during the slack period.

Other advantages of the VioBin process are 1) simple operation, 2) no obnoxious odors or liquid wastes, 3) fat produced is high quality, readily bleached, 4) protein meal is granular, free-flowing but not dusty, 5) fat yield is high and there are no protein losses, 6) dehydrated and defatted tissues are stable and can be stored "for years" without losing quality, and 7) process temperatures are low enough so that vitamins, amino acids, and other heat-labile constituents are conserved. To make the picture even more rosy, reports have it that the cost of operation is generally lower than that for competitive processes.

The process may be designed for either batch or continuous operation, in any size from small, self-contained units to

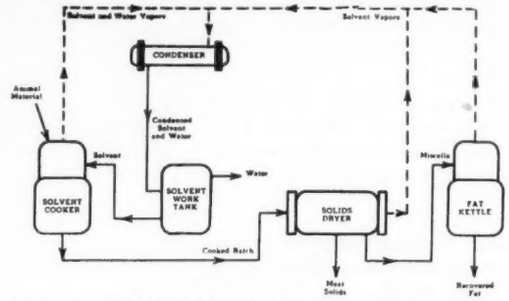


Figure 1—BATCH PROCESS: Cooking is done in vertical steam jacketed kettle. Solids dryer is actually combination dryer and filter; in here the miscella (fat-solvent mixture) drains off and residue is washed with fresh solvent. Solvent remaining in residue is removed by evaporation and is condensed for re-use. Depending on type of material being treated, the last trace of solvent may be removed by vacuum and by direct sparging steam. Discharged solids can be cooled, further ground if desired, and then bagged as high-protein meal. Miscella is distilled to separate solvent from fat; solvent is re-used and fat is sold or further processed. This type of system might be used with a packing house by-product

those which handle several hundred tons per day. In either case, the ground charge stock is first introduced into a mass of heated solvent and agitated so that the protein is coagulated.

The remainder of the process accomplishes two steps in a single operation: extraction of fat and water. Water and some of the solvent are boiled off from the mixture in a ratio corresponding to their relative vapor pressures. Mixture is condensed, the water discarded, and the solvent returned to the system. After all the water is removed by this azeotropic method, the miscella is drained off and the residue given one or more washes with fresh solvent. Then the miscella is evaporated to give a high-grade oil and release the solvent for re-use. The residue is dried to

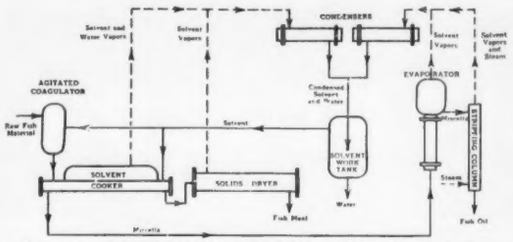


Figure 2—CONTINUOUS PROCESS: Here charge is first fed to continuous agitator vessel (coagulator) and then goes to the continuous cooker which is a screw conveyor in a long, horizontal, vapor-tight jacketed trough, with vapor collecting space above that leads to condenser. The solids from the cooker are drained free of excess solvent before they are fed to the continuous dryer where remaining solvent is removed. This is a suggested flow sheet for a plant reducing raw fish materials into fish meal. The dryer, the units for evaporating and steam stripping solvent from the miscella to obtain fish oil, and the solvent recovery system may be any of the continuous types now in established use in the vegetable oil industry

recover solvent and produce finished meal. Figure 1 shows how the process is operated batch-wise; Figure 2 how it is operated as continuous system.

(The VioBin Corporation has appointed H. L. Barnebey as a non-exclusive licensing agent for the process. His address is H. L. Barnebey, Dept. CP, P. O. Box 144, Pittsburgh 30, Pa. . . . or for more information check CP 2255 on handy form, pages 2 and 3.)

Develop "cold" polybutadiene to solve odor problem in synthetic rubber . . .

being produced in pilot plant quantities, it promises to increase use of latex in foamed rubber

A major improvement in the quality of synthetic rubber, the production of an odorless latex for use in foamed cushioning, was announced recently. Developed by The Goodyear Tire & Rubber Co. in a research and development program sponsored by the Synthetic Rubber Division of the Reconstruction Finance Corporation, the new latex is being produced on a pilot plant scale.

Dr. R. P. Dinsmore of Goodyear describes the material as "cold" polybutadiene, meaning that styrene used heretofore with butadiene in "cold" latex production, has been entirely eliminated. In addition, he regards the new synthetic as the most important improvement in synthetic latex quality since production of man-made latex was started in 1945.

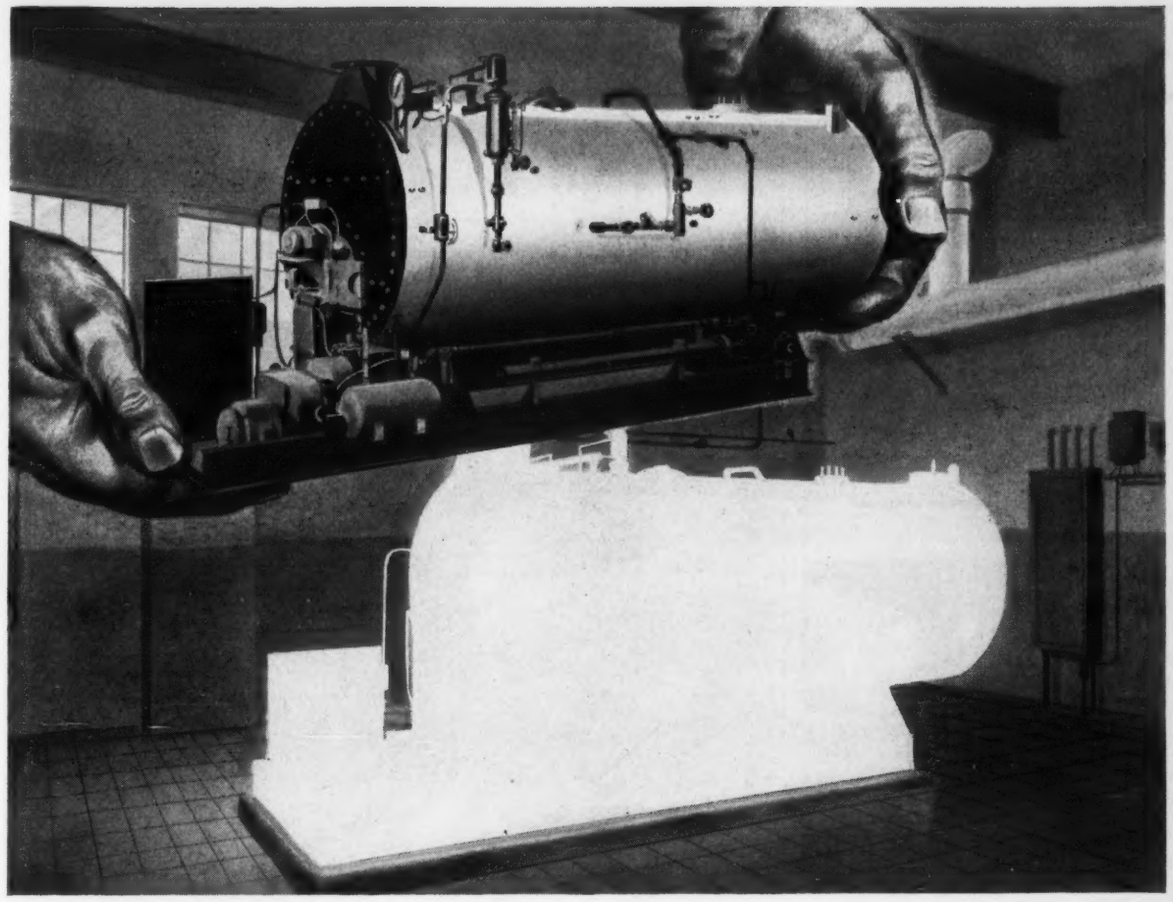
Use of synthetic rubber latex in foamed rubber prior to this latest development presented a formidable problem — an objectionable chemical odor. Complaints of the latter were industry-wide and greatly limited the use of synthetic-natural blends. The trouble was traced to the styrene part of the rubber latex, and this prompted a research program to develop a material which would possess top-notch qualities and yet be free of odor.

Polybutadiene by the "hot" process solved the odor problem, but the strength and toughness were proven to be unsatisfactory.

The more difficult problem of making "cold" polybutadiene was then attacked. Months of research and development resulted in the new material. It is identified by the government as Type X-653.

(Information courtesy of The Goodyear Tire & Rubber Co., Dept. CP, Akron 16, Ohio.)

Ready when you need it...



Save Installation-Construction Time — Expedite Emergency Installations — Serve Immediate Temporary Steam Needs — With a Cleaver-Brooks Self-Contained Boiler

WHEN speed is vital, you can save weeks of valuable installation time with a Cleaver-Brooks boiler — delivered to location as a complete, factory assembled and tested, self-contained unit, with much of the trim and accessories provided.

In an emergency the installation time can be reduced to as little as 48 hours, by following a properly planned and coordinated procedure of providing in advance the required facilities — foundations, headers, service and blow-off lines, fuel tanks and lines.

Prior to the completion of your building, Cleaver-Brooks boilers can be placed in operation to serve immediate steam needs. When permanently installed the change-over takes place with a minimum of labor and expense and the avoidance of interrupted steam service.

Cleaver-Brooks are the first and finest in modern, self-contained boilers — operate at a guaranteed efficiency of 80% — burn the fuel most available and economical in your area, gas, oil, or combination gas and oil — fully meet all codes — standard models available in sizes 15 to 500 hp; 15 to 250 psi.

CLEAVER-BROOKS COMPANY
Originators of the Self-Contained Boiler
Dept. F-348 E. Keefe Ave., Milwaukee 12, Wis., U.S.A.
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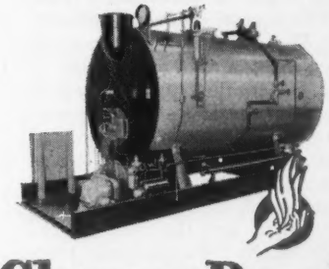
Write for latest, fully illustrated and descriptive Cleaver-Brooks Steam Boiler Catalog.

WHY INSTALLATION TIME IS CUT:

- Simple Low-Cost Stack
- No Job-Site Brickwork — No Special Foundations
- Boiler Delivered as a Complete, Factory Assembled, Tested, Self-Contained Unit
- Centralized Responsibility — No Waiting on Multiple Sources of Supply



Cleaver-Brooks

Builders of Equipment for the Generation and Utilization of Heat • Steam Boilers • Oil and Bitumen Tank-Car Heaters • Distillation Equipment • Oil and Gas-Fired Conversion Burners

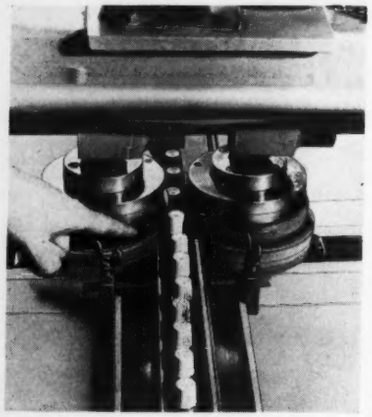
When inquiring check CP 2256 on handy form, pgs. 2-3

Plastic cap-tightening wheels outlast rubber types twenty times . . .

molded from vinyl plastisol, wheels are abrasion resistant

Problem: The rubber wheels used in the nail enamel cap-tightening machine at Revlon Products Company, New York, had to be replaced every eight hours. Furthermore, the wheels had to be adjusted several times during the eight-hour day because their surfaces wore away and caused gradual change in degree of cap tightening. Caps used have a knurled pattern and are made of urea plastic.

Solution: First attempt in solving the problem involved machining an experimental wheel from a sheet of



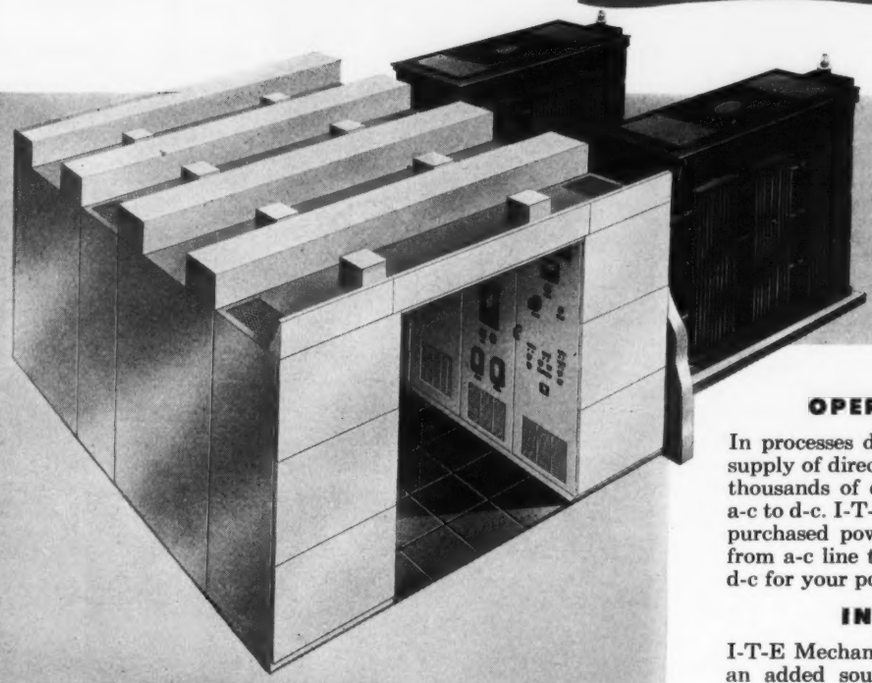
As bottles of nail polish pass between revolving wheels, their caps are screwed down to uniform tightness

molded Geon vinyl plastic. This wheel lasted forty hours, but it wasn't an easy matter to shape a wheel from the plastic slab. So, Revlon looked for and found a form of vinyl that could be readily molded into a wheel.

A plastisol compound (fluid dispersion of resin in plasticizer) made with Geon paste provided the answer. The material could be easily handled using simple equipment — in fact, the equipment used early in the experiments at Revlon consisted of a hot plate to heat the mold, and a sheet metal cover to keep the heat in. The plastisol was simply poured into the mold, the mold placed on the hot plate, and the cover placed over the mold. Fusion took place at 375°F.

Results: Wheels molded from the Geon plastisol last as long as 160 hours, or twenty times as long as the rubber wheels. Because of the higher resistance to abrasion, the plastic wheels do not have to be

GET MORE D-C



I-T-E Mechanical Rectifiers
96% conversion efficiency from a-c line to d-c bus!

How it works

Take a sine wave

Modify it like this with a *Permeron-core reactor

Make contact here — Break contact here

Do it 1,296,000 times an hour and get this

. . . with a conversion efficiency of 96% or better

*I-T-E's special saturable core material.

OPERATING ECONOMY

In processes demanding a heavy, dependable supply of direct current, you can actually save thousands of dollars a year on conversion of a-c to d-c. I-T-E Mechanical Rectifiers convert purchased power with 96% overall efficiency from a-c line to d-c bus. This gives you more d-c for your power dollar.

INITIAL SAVINGS

I-T-E Mechanical Rectifiers provide you with an added source of savings. One complete, compact, enclosed Rectifier assembly—transformer, reactor, contact mechanism, overhead bus, d-c switchgear—fits into 120 square feet. No big investment in special building or installation equipment is required.

LOW MAINTENANCE

Maintenance is limited to contacts, their operating mechanism, and small auxiliaries. Contact replacement, when necessary, is simple and inexpensive.

CAPACITY RANGE

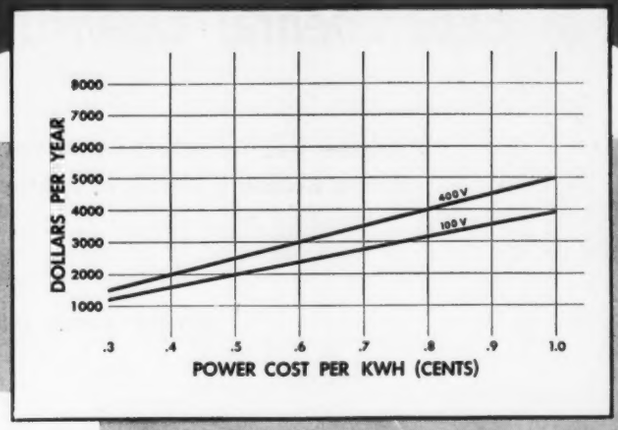
3,000, 4,000, 5,000, 6,000, 7,000, 8,000, 9,000 and 10,000 amperes in any voltage from 50 to 400 volts d-c.

Primary voltages up to 25,000 volts, three phase a-c.

One or more units may be connected in parallel to give any higher d-c current rating.

FROM THE POWER YOU BUY

Save thousands of dollars a year on power costs



This power cost-savings curve, based on figures published by *Chemical Week*, shows you just how much you can save when converting a-c with I-T-E Mechanical Rectifiers . . . If you're using large blocks of power, even a slight improvement in efficiency can save you thousands of dollars a year.

EXAMPLE:

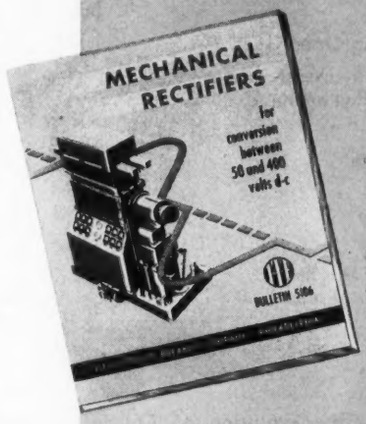
Suppose you are buying 2000 KW for 24-hour operation, 350 days a year. A 3% gain in power conversion efficiency with the I-T-E Mechanical Rectifier can save you more than *$3500* a year!

FIGURE IT OUT—

2000 x 24 x 350 = 16,800,000 KWH/year
With a 3% improvement in efficiency you save:
(16,800,000) (.03) = 504,000 KWH/year

Assuming a nominal industrial rate of 7 mills/KWH:
(504,000) (.007) = $3,528 yearly saving.

Here's how a few percent boost in power conversion efficiency slashed one industrial user's power bills three and a half thousand dollars a year. Check your own power consumption. See how much *you* can save with the high efficiency I-T-E Mechanical Rectifier.



SEND FOR DETAILS

New 30-page booklet gives you detailed information on the power-saving I-T-E Mechanical Rectifier. Illustrated, complete with curves, it tells you the full story about this precision-engineered equipment. Write for your copy of **Bulletin 5106** today.

I-T-E

MECHANICAL RECTIFIERS

I-T-E CIRCUIT BREAKER COMPANY
Mechanical Rectifier Division
19TH AND HAMILTON STREETS, PHILADELPHIA 30, PENNSYLVANIA
Canadian Mfg. and Sales: Eastern Power Devices, Ltd., Toronto
Export Sales: Philips Export Corp., N. Y. 17, N. Y.

adjusted anywhere near as often as did the rubber wheels.

(Plastisol was made by Rubber Corporation of America, Dept. CP, Brooklyn 6, N. Y. . . . or for more information check CP 2257 on handy form, pages 2 and 3.)

(Geon sheet and paste are made by B. F. Goodrich Chemical Company, Dept. CP, 324 Rose Bldg., Cleveland 15, Ohio . . . or for more information check CP 2258 on handy form, pages 2 and 3.)

Removes dust which air blasting couldn't dislodge before . . .

pebbles in tumbling mill gave dust static charge

Problem: Dust was coating and defacing the surface of dinnerware china during its manufacture. Situation arose with flint pebbles in a tumbling mill where cleaning and smoothing is done prior to glazing. The pebbles acquired a charge of static electricity which was imparted to the dust formed during the glazing operation. Even air blasting could not remove this dust.

Solution: Pebbles were immersed for five to ten minutes in Aquadag, a dispersion of colloidal graphite in water, then withdrawn and allowed to air-dry thoroughly before being put back into use.

Results: The colloidal graphite film which remained on the pebbles prevented the accumulation of the static charge and thus facilitated the quick removal of dust from china.

(Aquadag is manufactured by Acheson Colloids Co., Division of Acheson Industries, Inc., Dept. CP, Port Huron, Mich. . . . or for more information check CP 2259 on handy form, pages 2 and 3.)

Ways and means to control bacteria

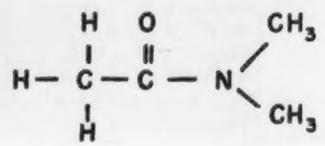
Loose-leaf folder presents line of germicides and fungicides for mold and bacteria control. Booklet describes typical applications in such industries as: paint, leather, adhesives, paper, textiles, and disinfectants. Physical and chemical properties of green industrial germicides and fungicides.

Bul "Dowicide" is issued by The Dow Chemical Company, 1000 Main St., Midland, Mich. When inquiring specify 2260 on handy form, pgs. 2 & 3.

For more information on product at left, specify CP 2261 . . . see information request blank between pages 2 and 3.

Four Methyl Amine Derivatives Offered in Experimental Quantities

Foresee use as selective solvent, source for dimethyl amine, building blocks in syntheses



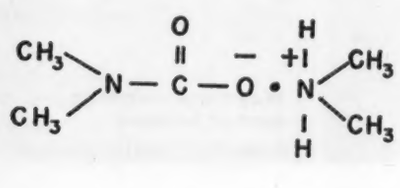
N,N-DIMETHYL ACETAMIDE

DMAC is a water-white liquid having a slight amine odor. Excellent solvent properties offer promise as a medium for carrying out organic reactions. Solubility-temperature curves are steep and suggest use as a crystallization solvent.

Preliminary tests indicate that no serious corrosion results from contact of DMAC with mild steel (type 1018), stainless steel (type 304), or aluminum. However, it promotes reaction between iron and certain halogenated compounds. This reaction is highly exothermic and may become violent. It is therefore recommended that mixtures of DMAC and halogenated compounds never be used or stored in metal (especially iron).

The product is stable at temperatures up to its atmospheric boiling point (165°C) in the absence of water, acids, bases, etc. DMAC containing 5.0% water by weight (20.2 mole per cent) and having a pH of 9.36 (as measured in water containing 20% DMAC by weight) is hydrolyzed to the extent of less than 0.02% at 95°C in 140 hours.

The chemical reactions of DMAC are typical of those of di-substituted amides. Under suitable conditions it undergoes hydrolysis in presence of strong acids, saponification in the presence of strong bases, alcoholysis, exchange, amide interchange, etc.



DIMETHYL AMMONIUM DIMETHYL CARBAMATE

DMC is a viscous, water-white liquid having an odor essentially the same as dimethylamine. In general, it reacts chemically as though it were a solution of dimethyl amine and, as such, may provide a convenient source, or reservoir, of dimethyl amine. With acidic substances, alkyl halides, isocyanates, carbon disulfide, etc, the carbamate reacts with the evolution of carbon dioxide to form products that result from reaction of dimethyl amine and the respective reactants.

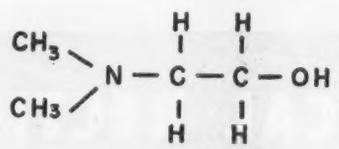
Stability of DMC in neutral aqueous solutions appears to be very good since it can be recovered essentially quantitatively by distillation. In acidic media the salt decomposes rapidly with the evolution of CO_2. In aqueous basic media the hydrolysis is much slower.

Product is miscible with water in all proportions and may be distilled from its aqueous solution. It is miscible in all proportions with all the common organic solvents except aliphatic hydrocarbons.

METHYL AMINE CHEMICALS

Property	DMAC	DMC	DME	DMHA
Molecular Weight	87.12	134.17	89.14	103.12
Boiling Point, °C	165.2	60.2	134.5	218
Freezing Point, °C	—20	——	—50	+45
Viscosity @ 25°C, cp	0.93	63.3 (absolute)	3.36	2.93 (@ 50°C)
Refractive Index	1.4351 (n25/D)	1.4512 (25°)	1.4273 (n25/D)	1.4510 (n50/D)
Flash Point (Tag Open Cup), °C	77	17	50	120
Solubility, gm hydrocarbon per 100 gm methyl amine @ 25°C				
Benzene	CM*	CM	CM	CM
Diisobutylene	CM	9	CM	1.5
N-hexane	CM	5.5	CM	——
Cyclohexane	CM	13	CM	2.3
Cyclohexene	CM	CM	CM	CM

* Completely Miscible.



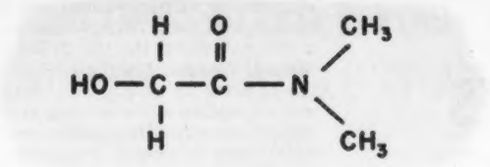
2-DIMETHYL AMINO ETHANOL

DME is a water-white liquid having a slight ammoniacal odor. It is useful as an intermediate in the manufacture of long-chain surface active esters, quaternary ammonium compounds, as well as pharmaceuticals (antihistamines for example).

Characterized by high solubility with water, alcohols, ketones, aromatics, paraffins, olefins, and chlorinated compounds. Preliminary tests indicate that no serious corrosion results from contact of DME with mild steel (type 1018), stainless steel (type 304), or aluminum.

Reported to be stable at temperatures up to, and above, its atmospheric boiling point (134.5°C).

Undergoes typical reactions of primary alcohols and tertiary amines: salt formation, quaternary salt formation, N-oxide formation, reaction with acyl halides and thionyl chloride, ester exchange, and 2-stage reaction to choline esters. All products derived from DME in which a halogen atom replaces the hydroxyl group are members of the nitrogen mustard family and must be handled with extreme caution.



N,N-DIMETHYL HYDROXY ACETAMIDE

DMHA is a white, crystalline, hygroscopic solid with a slight amine odor. It exhibits excellent solvent power for alcohols, ketones, and aromatic compounds; solubility is low for aliphatic, naphthenic, and olefinic compounds. This suggests its use as a selective solvent in the separation of organic mixtures.

Undergoes the reactions of a primary alcohol and can be esterified in the usual manner. Typical are self-alcoholysis (polymerization), thermal decomposition, hydrolysis, and saponification.

Tests indicate that no serious corrosion will result from contact of DMHA with mild steel (type 1018), stainless steel (type 304), or aluminum. Containing 5% water (23.15 mole per cent water) and having a pH of 8.1 (as measured in water containing 20% DMHA by weight), the product is hydrolyzed to the extent of less than 0.02% in 48 hours at 95°C.

Product is relatively stable at temperatures below about 125°C. Above 175°C decomposition becomes appreciable. Because DMHA promotes reaction between iron and certain halogenated compounds that is sometimes violent, it is recommended that mixtures of DMHA and halogenated compounds never be used or stored in metal (especially iron).

(Products are available in experimental quantities from E. I. du Pont de Nemours & Company (Inc.), Grasselli Chemicals Department, Dept. CP, Wilmington 98, Del. or for more information check CP 2262 on handy form, pages 2 and 3.)

Aids flow casting of rubber latices which do not form layers of sufficient thickness . . .

tests indicate that 1% of Bentonite is optimum quantity for improving deposition

When latex is poured into a porous plaster mold, the plaster absorbs water from the latex. As a result a layer of concentrated latex will be deposited on the inside of the mold and consequently coagulate. Remaining liquid latex is then poured off, and rubber layer can be dried and vulcanized. Sometimes, however, in this flow casting of rubber, the thickness of the layer is unsatisfactory, especially when using latices without fillers.

Two researchers of Rubber-Stichting, Delft, Holland — E. J. Tebbes and J. V. Van Ulden — report on tests which indicate the favorable effect of Bentonite. By adding it in a quantity adapted by the kind of latex used, latices that do not form a layer of sufficient thickness are improved to such a degree that at room temperature in 30 min a deposition of 1.5 mm may be obtained from an uncharged compound.

Reaction of 40 latices of different origin, in combination with varying quantities of Bentonite, was investigated. Given below are results obtained with three latices chosen at random out of the 40 tested. Latices were mechanically mixed with Bentonite suspensions together with a stabilizer, Vulcastab L.W.; same dispersion of vulcanizing ingredients

(*Continued on next page*)

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potash division

INTERNATIONAL MINERALS & CHEMICAL CORPORATION
General Offices: 20 North Wacker Drive, Chicago 6
61 Broadway, New York 6

When inquiring check CP 2263 on handy form, pgs. 2-3

was added to all of them. Vulcastab L.W. protects against traces of calcium ions from the plaster.

These compounds were poured in open plaster molds of equal size and composition. During the period of deposition the molds remained covered; then they were emptied and the coagulant dried and vulcanized in heated air at 100°C. Finally the thickness of the layer was measured.

Following table shows thickness of layer in mm obtained with progressive quantities of Bentonite plus 0.5 Vulcastab L.W. Deposition period: 30 min.

	Parts of Bentonite per 100 parts of rubber			
	0	0.5	0.75	1
Latex 1	1.0	1.5	1.6	1.9
Latex 2	1.0	1.2	1.3	1.6
Latex 3	0.8	1.2	1.4	1.5

When more than 1% of Bentonite is used, the latex compound becomes too thick, so that this concentration may be considered the optimum quantity. However, it is suggested that every latex be tested to determine whether more Bentonite must be added. In the latter case either the deposition becomes thicker or the period of deposition can be shortened.

(Information courtesy of Natural Rubber Bureau, Dept. CP, 1631 K St., N.W., Washington 6, D.C.)

10-15° lower process temps for polyvinyl chloride

Geon 103 EP is a new polyvinyl chloride resin developed by the B. F. Goodrich Chemical Company that will process at temperatures 10 to 15°F lower than its other Geon polyvinyl chloride polymers. In spite of this advantageous lower processing temperature, none of the physical properties characteristic of Geon resins are forfeited.

Expanded utility, increased output by existing equipment, and improved quality are some of the advantages which may be obtained in PVC calendering, extruding, and injection molding operations.

Test runs on a 16" laboratory calender indicate that Geon 103 EP in both a typical 4-mil film and in a 12-gage sheet formulation exhibited at optimum conditions superior stability, better clarity, and better release characteristics than Geon 101 EP. Tests in a 1½" extruder show that compared to Geon 101 EP at the same conditions, Geon 103 EP will extrude 10% faster, produce a better surface, and require less power.

The rate of plasticizer absorption and general mixing characteristics of Geon 103 EP are similar to Geon 101 EP. Geon 103 EP is of interest in powder-mixing operations. Trials in the laboratory Banbury indicate that Geon 103 EP will mix in as short a time cycle as Geon 101 EP, but at an optimum temperature about 10°F lower.

Milling characteristics are similar to Geon 101 EP, except that the mills can be operated at a lower temperature for Geon 103 EP. The general physical properties of compounds containing Geon 103 EP are in most cases almost identical to those of similar compounds containing Geon 101 or 101 EP.

The lower optimum processing temperature of Geon 103 EP would indicate a loss in high temperature and low temperature properties. However, laboratory tests such as physical strength at elevated temperatures, blocking tests, sag tests, and low temperature brittleness tests show that Geon 103 EP has not changed significantly in these respects.

The electrical properties of Geon 103 EP are comparatively good. When Geon 103 EP is substituted directly into a

FATTY AMIDES: THEIR PROPERTIES AND THEIR USES

by Dr. M. R. Mc Corkle

A primary amide may be described as an organic acid derivative in which the (OH) group has been replaced by an amino (NH_2) group, forming a substantially neutral chemical called an amide ($RCONH_2$).

The name "Armid" is the Armour tradename given to the general class of amides derived from fatty acids. Since fatty acids are all straight-chained molecules, the Armids are likewise straight-chained.

GENERAL PROPERTIES

These high molecular weight amides are high-melting, wax-like materials. The chemically pure amides are water-insoluble and neutral. Commercially, the Armids may contain a few percent of the unreacted fatty acids from which they are made. The Armids vary in physical properties from a substance which can be flaked like stearic acid to a soft paste. The color of the saturated amides is lighter than the unsaturated amides will yield.

SOLUBILITIES

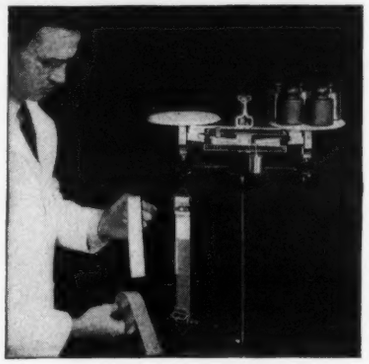
The Armids are soluble in ketones, esters, alcohols, turpentine, mineral spirits, fats and fatty acids; insoluble in water.

In general, amides are insoluble or only slightly soluble in organic solvents at room temperature, and increase in solubility at high temperatures.

In the saturated series, the longer the carbon chain of the amide, the less is the solubility. In each class of solvents, the higher the molecular weight of the solvent, the more amide it will hold in solution.

APPLICATIONS

Anti-block Agents. Here, the Armids are used in plastic and wax formulations in amounts up to 5%. Typical resins are vinyls, ethyl cellulose, and methacrylates.



Strips of paper coated with 135°F. AMP paraffin wax were overlapped under 1 lb. per sq. in. pressure at 120°F. for 16 hours. The strips (left) coated with wax containing 5% Armid HT fell apart under their own weight, showing no blocking. The strips coated with unmodified wax (right) blocked very badly. The blocked overlap is shown resisting the pull of 5,000 gm.

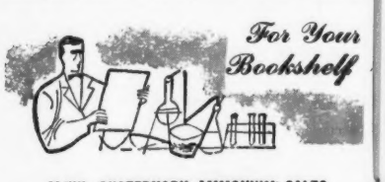
Mutual Solvents. Many synthetic resins can be made compatible with paraffin or microcrystalline waxes by using Armids as mutual solvents. They make possible a wide range of unique compounds with certain desirable properties of both plastics and waxes. A technical bulletin is available giving details of this application.

Printing Inks. The Armids are effective anti-offset, anti-scratch agents in printing inks. Unlike most such agents, they allow overprinting by another color. Send the coupon for a bulletin on this application.

The Armids have found uses in many other fields. For instance, generally they thicken, stabilize, or increase the spreadability of emulsions, even when added in small concentrations. As dye solubilizers, certain of the Armids hold more of some dyes than castor oil. Thus they give both increased dye solubility and anti-stick qualities to carbon paper, for example. Send the coupon for technical bulletins, samples, and a free booklet on the Armids.

HIGH MOLECULAR WEIGHT ALIPHATIC AMIDES—COMPOSITION AND CONSTANTS CHART

n-Primary Amides	Carbon Chain Length	Armid 8	Armid 10	Armid 12	Armid 14	Armid 16	Armid 18	Armid HT	Armid RO	Armid C	Armid O
Hexane	6	3	..	..	..	..	..	..	..	..	..
Octane	8	90	3	..	..	..	..	..	..	8	..
Decane	10	7	90	..	..	..	..	..	..	9	..
Dodecane	12	..	7	90	4	..	..	..	..	47	..
Tetradecane	14	..	..	9	90	..	..	..	..	18	..
Hexadecane	16	..	..	..	4	90	6	25	..	8	..
Octadecane	18	..	..	..	..	6	93	70	20	5	6
Octadecene	18	..	..	1	2	4	1	5	60	5	91
Octadecadiene	18	..	..	..	..	..	..	..	20	..	3
Substituted Cyclic	20	..	..	..	..	..	..	..	..	..	..
Approximate Melt Point °C.		97	97	97	97	97	100	98	72	90	..
Approximate % Unreacted Fatty Acid		5	5	5	5	5	5	5	5	5	..



ALKYL QUATERNARY AMMONIUM SALTS

The Arquads—alkyl quaternary ammonium salts—have found many uses, from ore flotation to emulsion exhaustion. Of particular interest are their germicidal properties. If you are working in any field involving the use of these versatile chemicals, or if you are looking for special types of quaternaries, ranging from water-soluble to oil-soluble, you should have Armour's booklet on the Arquads. Along with physical characteristics and use-data, there is a table showing the average composition of each of the Arquads. This tells which Arquad has the properties you need.

THE CHEMISTRY OF FATTY ACIDS

Another book giving both extremely useful background information and use-data is "The Chemistry of Fatty Acids." This booklet is designed to provide complete basic coverage of this complex and constantly expanding field. Contents include sources, composition, general and specific reactions of fatty acids, and a consideration of the major types of fatty acid derivatives. Send the coupon for your copies of these two useful booklets.

ARMOUR CHEMICAL DIVISION
ARMOUR AND COMPANY · 1355 WEST 31ST STREET · CHICAGO 9, ILLINOIS

COMMERCIALLY PURE CAPRIC ACID NOW AVAILABLE IN AMPLE SUPPLY

As a result of increased production capacity on Armour's coconut oil fatty acids, capric acid (Neo-Fat 9) is available to processors for new product development.

Capric acid occurs naturally as the glyceride in various vegetable oils and fats. It is a white crystalline substance lying between caprylic and lauric acid in the saturated fatty acid series.

SOLUBILITY AND COMPATIBILITY

At 60°C, Neo-Fat 9 is soluble in acetone, amyl acetate, benzol, butanol, carbon tetrachloride, dipentene, ethanol 95% and 100%, ethyl ether, kerosene, methyl cellosolve, turpentine, V. M. & P. naphtha and xylol.

Neo-Fat 9 is compatible (at 60°C) with asphalt, beeswax, carnauba wax, ester gum, gum rosin, linseed oil, paraffin wax, petroleum pale oil and soybean oil.

USES

Industries using pure capric acid will find Neo-Fat 9 of real interest. It is an excellent raw material for producing alcohols, aldehydes, ketones, esters, metallic salts, nitriles, amides, amines, etc.

In an insecticide formulation, the addition of 1-1200 Neo-Fat 9 killed over 99% of the green apple aphids. In other applications, capric acid is used in essences, synthetic perfumes, flavors, disinfectants, antifoaming agents, dyestuffs, pharmaceuticals, high boiling solvents, etc., and as a manufacturing intermediate in many synthetic organic compounds.

SAMPLES

A sample of Neo-Fat 9 is available for testing and evaluation. Check the coupon and samples will be mailed promptly.

Neo-Fat 9 is only one of a complete line of commercially pure coconut oil fatty acids offered by the Armour Chemical Division. Others include lauric acid (Neo-Fat 11), myristic acid (Neo-Fat 13) and caprylic acid (Neo-Fat 7). Specifications are shown in chart below.

NEO-FAT SPECIFICATIONS

	Iodine		Acid Value		Titer, C.		Color, Lovibond 5¼"	Caprylic	Capric	Caproic	Lauric	Myristic	Palmitic	Unsaturated Acids
	Min.	Max.	Min.	Max.	Min.	Max.	Min. Max.	%	%	%	%	%	%	%
Neo-Fat 7 (caprylic acid)	—	2.0	385	394	—	16°	— 0.5R-5Y	90	7	3				
Neo-Fat 9 (capric acid)	—	2.0	323	329	28°	33°	— 1.5R-10Y	3	90		7			
Neo-Fat 11 (lauric acid)	—	2.0	276	282	36°	42°	— 1.0R-10Y		trace		90	9		1
Neo-Fat 13 (myristic acid)	—	2.0	243	249	48°	52°	— 1.0R-10Y				4	90	4	2

NON-YELLOWING, FASTER DRYING ALKYDS POSSIBLE WITH NEO-FAT 3R

Neo-Fat 3R is an improved unsaturated fatty acid material, produced under exacting quality control by a new low temperature solvent crystallization process. When used to formulate alkyd resins, it gives faster drying and non-yellowing finishes. Its lower titer means this chemical can be exposed to temperatures as low as 5°C without the slightest solidification. Neo-Fat 3R's high iodine values and low saturated fatty acid content yield more double bonds per gallon of fatty acids, contributing better dry and harder films to alkyd resin finishes. Faster processing time and brilliant color are other important advantages of this improved chemical. Write today for Technical Bulletin A-1 and free samples for your testing and evaluation.

ARMOUR FATTY ACID DERIVATIVES MAKE EXCELLENT CATIONIC AND NON-IONIC EMULSIFYING AGENTS

Chemists are called upon continually to develop new magic emulsions to meet certain problems or special conditions. New answers to these problems are possible with cationic and non-ionic emulsions made with Armour's extremely versatile fatty acid derivatives.

Arquad 2C, a quaternary ammonium compound of the dialkyl dimethyl ammonium chloride type, is a cationic emulsifier for petroleum solvents and oils. It has special properties such as substantivity, acid corrosion inhibition, wetting and penetrating action, as well as germicidal properties. A surprisingly small amount of Arquad 2C produces stable emulsions of fine particle size. It is soluble in many organic solvents and disperses readily in water—a particular advantage in preparing emulsifiable concentrates. Arquad 2C is stable in strong acids and bases. Kerosene emulsified in phosphoric acid, using Arquad 2C as the emulsifier, makes a very good metal cleaner.

Armac HT, acetic acid salt of hydrogenated tallow amine, is a strongly cationic emulsifier for waxes and resins and is particularly suitable for non-rewettable coating applications. Armac HT is an efficient low-cost emulsifier.

Ethomeens, Ethomids and Ethofats, polyethylene oxide derivatives of fatty amines, fatty amides and fatty acids, find application where the presence of interfering ions, such as sulfates and phosphates, would prohibit the use of cationic or anionic surface-active chemicals.

The Ethomeens are very efficient emulsifiers for petroleum solvents for use as degreasers and emulsion cleaners. Stable emulsions of kerosene in strong acids are possible with the Ethomeens. Because of the ease with which emulsions form, no elaborate equipment for mixing and dispersing is required with the Ethomeens, Ethomids or Ethofats.

Ethofat 60/15 is particularly effective for stable water-in-oil emulsions of mineral and vegetable oils. Because it is neutral and nontoxic, it is useful for cosmetics.

These are but a few examples of the emulsion magic possible with Armour's fatty acid derivatives. Let Armour help you with your emulsion problem. Write for Technical Bulletin No. F-2.

Mail this coupon

Literature: ☐ Arquad Booklet ☐ Chemistry of Fatty Acids ☐ Tech. Bulletin No. A-1 ☐ Armids Booklet ☐ Armid HT in Printing Inks ☐ Tech. Bulletin No. F-2 ☐ Mutual Solvents

Samples: ☐ Arquad 2C ☐ Neo-Fat 3R ☐ Neo-Fat 11 ☐ Armac HT ☐ Neo-Fat 9 ☐ Neo-Fat 13 ☐ Ethofat 60/15 ☐ Neo-Fat 7

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1

FATTY ACIDS

LONG-CHAIN FATTY ACID DERIVATIVES

INDUSTRIAL OILS

When inquiring check CP 2264 on handy form, pgs. 2-3

MATERIALS

Geon 101 compound, the plasticizer content should be reduced by approximately 4% (two parts per 100 of resin) to maintain the same hardness.

Because Geon resin 103 EP is a straight polyvinyl chloride, the same type and quantity of stabilizer as used with Geon 101 and 101 EP are satisfactory. The same type of lubricant can be used with Geon 103 EP as with the other Geon 100 series resins. The quantity may need to be varied to compensate for the change in plasticizer ratio.

(Summary of information received from the B. F. Goodrich Chemical Company, Dept. CP, Rose Building, Cleveland, Ohio . . . or for more information check CP 2265 on handy form, pages 2 and 3.)

Promising use in isolation and purification of complex isomers . . .

ketone is bright yellow crystalline solid with melting point between 175.5-176.5°C

Uses: Has been shown to form complexes with polynuclear hydrocarbons and their derivatives. Ease of formation and stability of these complexes make possible the identification of condensed ring system compounds.

The complexes are easily decomposed and the pure components separated. This property makes possible the separation of isomers and other compounds difficult to purify. Thus, separation of pure components has been done quantitatively by chromatographic adsorption on activated alumina and by chemical reduction of the subject compound to the amino analog. It has been found that ultra violet spectrograms of the complexes agree almost exactly with the curve obtained by the addition of the molar extinction coefficients of the pure components.

Features: Complexes formed are brightly colored and have high, sharp melting points — properties of value when using compound for identification purposes.

Description: TNF or 2,4,7-trinitrofluorenone is a bright yellow crystalline solid with melting point between 175.5 and 176.5°C. It has a molecular weight of 315.19 and is available in 10 to 500 gram lots.

(Product of Dajac Laboratories, a Division of Monomer-Polymer, Inc., Dept. CP, 3430 W. Henderson St., Chicago 18, Ill. . . . or for more information check CP 2266 on handy form, pages 2 and 3.)

Tabulates killing power of insecticide

Eight-page booklet offers comparative testing data to show effectiveness of isobornyl thiocyanoacetate as toxicant in insecticide sprays. Three aerosol formulas are listed to meet requirements for low pressure use. Formulas meet specifications of T.O.T.A. and are approved by USDA. Chemical and physical properties of toxicant are summarized in addition to toxicity test data on rodents and human subjects.

Results of tests are presented in terms of 3, 5, and 10 minute knockdown, and 24 hour kill. Tests were run by independent biological laboratory on isobornyl thiocyanoacetate alone and in combination with other toxicants. "Take a Good Look at Thanite" is issued by Hercules Powder Company, Dept. CP, Ninth and Market Sts., Wilmington 99, Del. When inquiring specify CP 2267 on handy form, pages 2 and 3.

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covering physical, chemical and performance characteristics . . . uses, applications and formulations.

onyx

ONYX OIL & CHEMICAL COMPANY
INDUSTRIAL DIVISION
184 WARREN ST., JERSEY CITY 2, N. J.
CHICAGO • BOSTON • CHARLOTTE • ATLANTA
In Canada: Onyx Oil & Chemical Co., Ltd., Montreal, Toronto, St. Johns, Que. For Export: Onyx International, Jersey City 2, N. J.
West Coast Representative: E. S. Browning Co., San Francisco, Los Angeles

When inquiring check CP 2268 on handy form, pgs. 2-3

Articles cover industrial coloring plus recent plastic products

Twelve-page house organ contains articles on the origin of plastics, recent plastic products, and industry's use of color. Among laboratory developments is liquid stabilizer for vinyl resins. Stabilizer is mixture of barium and cadmium soaps in combination with liquid synergistic stablizer. Fluid composition permits it to be readily compounded in polyvinyl chloride formulations. Substance is recommended for plastisols and organisols because no pregrinding is necessary for complete dispersion.

Another laboratory suggestion pertains to salts of metal copper for protection of cellulosic products from mildew and fungus. Two-color booklet also describes fatty acid ester for use as plasticizer in rubber industry. Product is relatively non-volatile and solidifies below 10°C. It may be used for plasticizing chlorinated rubber and will swell both crude and vulcanized rubber. Possible uses of color are discussed as they affect safety, illumination, and morale. According to booklet, painting machinery in contrasting colors may make close and exacting work easier, as well as highlight areas of danger. Adjustments in industrial coloring are said to reflect on production output. Booklet mentions case in which accident rate dropped from $1.21 per man to $0.18 per man, after repainting machines in accordance with principles of industrial coloring.

Brief narrative covers development and beginning of plastics industry. Booklet concludes with survey of news items from chemical and allied fields. "Witcombings" is issued by Witco Chemical Company, Dept. CP, 295 Madison Ave., New York 17, N. Y. When inquiring specify CP 2269 on handy form, pages 2 and 3.

Report wide application for a series of nonionic surface active agents . . .

include emulsifiers, dispersants, detergents, thickeners, plasticizers, stabilizers, etc

Uses: Group of nonionic surface active agents covering usage of emulsifiers, interfacial tension depressants, spreading agents, dispersants and detergents, thickeners, plasticizers, wetting agents, and stabilizers. Find application in agriculture, fuel oils, metal processing, plastics, polymers, starch stabilization, textiles, paints, pharmaceuticals, etc.

Features: Stable at high temperatures, have low vapor pressure, and may be distilled only under very high vacuum. Aqueous solutions are almost neutral (pH 6.5), are stable to autoclaving and in the pH range from 3.5 to 9.5, but hydrolyze beyond this range. Compatible with either anionic or cationic materials and may often be combined advantageously with these.

Description: The Nonisols are polyoxyalkylene fatty ester type surface active agents — all substantially 100% active oils or soft waxes. All are light colored, bland in odor and taste. Acid number does not exceed 6.0 and ash content is less than 0.1%. They are all either soluble or dispersible in cold water, usually yielding viscous, thixotropic solutions.

Like other nonionics, they are insoluble in very hot water. All are soluble in alcohols, ethers, ketones, esters, chlorinated and aromatic hydrocarbons, but have limited solubility in glycerine, ethylene glycol, and propylene glycol. Nonisol 210 forms clear, stable solutions in kerosene and mineral oil; with some petroleum

oils, however, a trace of water may have to be added to obtain clarity.

	NONISOLS					
	100	110	200	210	250	300
Solidification Temperature, °C	3	6	—8	—10	32	31
Solubility* in						
Water	S	D	D	D	S	D
Xylene	S	S	S	S	S	S
Kerosene	I	D	I	S	I	"S"
Specific gravity	1.03	1.00	1.00	0.98	1.04	1.00
Iodine number	2	3	38	55	10	1

* S—soluble; D—dispersible; I—insoluble; "S"—soluble over 31° C.

(Products of the Alrose Chemical Company, Dept. CP, Providence 1, R. I. . . . or for more information check CP 2270 on handy form, pages 2 and 3.)

Bright plating baths are taking advantage of pure chemicals . . .

nickel sulfate, potassium cyanide, zinc cyanide are exceptionally pure, in plentiful supply

Electroplaters having difficulty with bright plating baths and precious metal plating because of impurities in technical grade potassium cyanide should be interested in the following announcement. Octagon Process, Inc., is now offering potassium cyanide of exceptionally high purity, and says that "bugs" in bright plating are eliminated with their product because no sulfide impurities are present.

Nickel sulfate and zinc cyanide are two other plating chemicals of high purity that are in plentiful supply with this concern. These are being imported and will help relieve the domestic scarce supply. The nickel sulfate is reported to exceed the American material in quality, and is particularly useful in bright nickel plating baths. Zinc cyanide is free of lead and also useful in bright plating baths.

(Product of Octagon Process, Inc., Chemicals Division, 15 Bank Street, Staten Island 1, N. Y. . . . or for more information check CP 2271 on handy form, pages 2 and 3.)

Tabulates polyester resins for reinforced plastics

Thirty-page booklet lists characteristics of several polyester resins for use in formulating lightweight, reinforced plastics. Ten pages of two-color catalog are devoted to graphic survey of polymerization time and approximate exothermic temperature rise of various resins. Properties of each resin are summarized. Electrical characteristics of one type resin include electrical "transparency" for radar housings. Another type is highly flexible and is used to impart added toughness to other polyester resins.

Resins are said to produce structural plastics with high strength-weight ratios that compare favorably with aluminum and steel. According to booklet, resins provide excellent resistance to high and low temperatures, as well as moisture and many chemicals. Information is also presented on US Air Force Specifications, bench life of resins, fillers, and similar material. "Polyester Resins for Reinforced Plastics" is issued by Bakelite Company, Division of Union Carbide and Carbon Corporation, Dept. CP, 30 E. 42nd St., New York 17, N. Y. When inquiring specify CP 2272 on handy form, pages 2 and 3.

Hooker Chemical Guide
(ONE OF A SERIES)
USE this handy reference to save time in selecting high quality chemicals.

HOOKER
SULFIDES

SODIUM SULFIDE

Formula: Na_2S

Appearance: Light, buff colored solid in flake form

TYPICAL PROPERTIES

Molecular Weight	78.1
Melting Point	100° C
Na_2S	60-62%
Water of Crystallization	35% min.
NaCl	1.5% max.
Other Na Salts	2.0% max.
Fe	8 ppm max.
Other Heavy Metals	1 ppm max.

USES

Dehairing Agent: Hides
Desulfurizing Agent: Viscose rayon
Intermediate: Chemicals, dyestuff intermediates
Metal Processing: Ore flotation, metal refining
Other Uses: Manufacturing paper pulp, rubber; textile processing.

SODIUM SULFHYDRATE

Synonym: Sodium Hydrosulfide
Formula: NaSH
Appearance: Light lemon colored solid in flake form

TYPICAL PROPERTIES

Molecular Weight	56.1
Melting Point	55° C
NaHS	70 to 72%
Water of Crystallization	26% min.
Na_2S	2.5% max.
Other Na Salts	1.2% max.
Fe	5 ppm max.
Other Heavy Metals	1 ppm max.

USES

Dehairing Agent: Hides
Desulfurizing Agent: Viscose rayon
Intermediates: Dyestuffs; organic chemicals such as thioamides, thiourea, thioglycolic acid, thio- and dithiobenzoic acids, sodium thiosulfate.

SODIUM TETRASULFIDE SOLUTION

Formula: Na_2S_4
Appearance: Clear, dark red aqueous solution

TYPICAL PROPERTIES

Molecular Weight	174.2
Freezing Range	3.5° to —17° C
Distillation Range	115° to 120° C
Specific Gravity, 15.5°/15.5° C	1.335
Na_2S_4	40%
Sulfur	30%

USES

Soaking Agent: Hides and skins prior to unhairing
Reducing Agent: For organic nitro bodies
Reagent: Ore flotation
Intermediate: Sulfur dyes

For detailed information on items listed, drop us a note on your letterhead. Address your request to HOOKER ELECTROCHEMICAL COMPANY, 15 Forty-Seventh Street, Niagara Falls, N. Y.

HOOKER ELECTROCHEMICAL COMPANY

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HOOKER CHEMICALS®

2-325

From the Salt of the Earth

When inquiring check CP 2273 on handy form, pgs. 2-3

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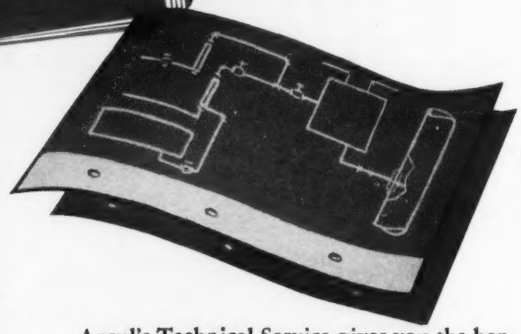


CONSULT ANSUL'S STAFF of trained and experienced Chemical Engineers.

If you have a problem or process involving acidifying, neutralizing, bleaching, preserving, dechlorinating, reducing, deoxidizing, etc., Ansul's Engineers can be of service to you.

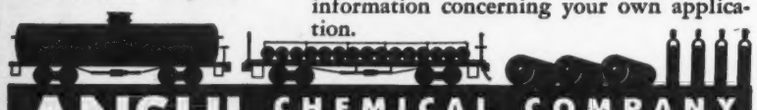
Call on them for assistance, without cost or obligation.

Ansul's Technical Service gives you the benefits of improved process efficiencies and quality control when using Ansul Liquid Sulfur Dioxide.

New uses of liquid sulfur dioxide are continually being developed. It's HIGH PURITY, GREATER ECONOMY, AND EASE OF CONTROL provide a versatile and effective chemical to a great variety of industries.

To compliment the availability of liquid sulfur dioxide, Ansul has cataloged years of experience and research to provide a complete technical service covering present and potential uses of SO_2 in industry.

Write for File No. 303 and ask for specific information concerning your own application.



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60 E. 42nd St., New York — Lincoln Liberty Bldg., Broad & Chestnut St., Philadelphia 7, Pa.
ALSO MANUFACTURERS OF REFRIGERANTS, REFRIGERATION PRODUCTS AND DRY CHEMICAL FIRE EXTINGUISHERS

When inquiring check CP 2274 on handy form, pgs. 2-3

Greases from Li hydroxystearate have good shear stability and low volatility . . .

soap has very low free fatty acid content — insuring a grease of good oxidation stability

Uses: As a gelling agent in the manufacture of synthetic and multi-purpose greases.

Features: Greases prepared with this soap have excellent shear stability, high dropping points, low volatility, good anti-wear qualities and water resistance. Soap is of high purity and very low free fatty acid content which insures a grease of good oxidation stability.

Description: Witco Lithium Hydroxystearate is a white powder of 99 per cent fineness through a 100 mesh, has a softening point of 205°C and a specific gravity of 1.0. It is packaged in 50 pound cartons.

Analysis:

Lithium content, %	2.2
Free fatty acid, %	0.3
Moisture, %	0.5

(Product of Witco Chemical Co., Dept. CP, 295 Madison Ave., New York 17, N. Y. . . . or for more information check CP 2275 on handy form, pages 2 and 3.)

Conservation of Ni and Cr in high-temp casting alloys subject of research . . .

21Cr-9Ni looks best for strength, corrosion resistance in 900-1400°F temperature range

Conservation of vitally needed nickel and chromium in heat resistant castings is the objective of important research just announced by the Alloy Casting Institute of Mineola, New York. Conducted at the Battelle Memorial Institute, research has been concentrated on developing a heat resistant material of lower alloy content than the high nickel alloys frequently used in 900-1400°F service.

From knowledge of the iron-chromium-nickel alloy system and field experience, casting metallurgists selected an alloy containing 21% chromium and 9% nickel — designated as the HF type — as the material most likely to provide the combination of strength and corrosion resistance required for 900-1400°F service. Tests to date indicate that this alloy offers a promising solution to the requirements of such service.

The research team, under the supervision of J. H. Jackson, is now investigating a series of 14 compositions within the HF alloy specification range, to determine which compositions will offer optimum mechanical properties at elevated temperatures. If the present research on HF alloy continues favorable, then users should be able to substitute this grade in many intermediate temperature applications for materials containing from 30-100% more nickel, thereby freeing supplies of this vital element for higher temperature applications where its use is indispensible.

HF grade probably would have been investigated for this use a long time ago, except for the mistaken assumption that its properties in the 900-1400°F range are inferior to the higher alloy materials. This incorrect idea doubtless arose from the fact that wrought stainless steels containing about 18% chromium and 8% nickel have considerably less high temperature strength than the cast alloys of the 25% chromium-12% nickel and the 35% nickel-15% chromium types.

This is not true in casting alloys since the latitude of compositions possible in cast alloys allows use of chemical ranges unsuited to wrought alloy production. Tests now

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handles . . . with the GREATEST OF EASE!

In fact, when used in making cellulose derivatives, new and modern SOLKA-FLOC is *far easier to handle* than older forms of cellulose. That's because it comes in loose form, flows almost like liquid and lends itself to continuous operation.

Unusually high density and *relatively high reactivity* are other important advantages you'll find in SOLKA-FLOC. It might open up for you new product possibilities which would not be possible with other forms of cellulose. Learn more about this versatile product. Write to Dept. BF-5 at our Boston office.

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When inquiring check CP 2276 on handy form, pgs. 2-3

being made indicate the cast HF material to have strength comparable to higher alloyed cast grades at these intermediate temperatures.

This development is a striking illustration of the fact that the same nominal composition in wrought and cast alloys does not mean that mechanical properties of each material are the same — frequently they are quite different. This situation points up the necessity for using the ACI alloy designations in ordering castings, rather than the AISI type numbers (302, 304, etc) which are associated with wrought material only.

(Alloy Casting Institute, Dept. CP, Mineola, New York.)

Thin alkyd paint resin to 5 per cent solids without "throw-out" . . .

affords rapid finishing due to fast air-drying property

Uses: Air-dry, Glyptal alkyd paint resin designed primarily for general-purpose primers and finishes.

Features: Has exceptionally high tolerance for petroleum solvents — can be reduced to 5% solids with mineral spirits without danger of "throw-out."

Said to afford rapid finishing because of resin's snap-dry."

Description: G-E 7315 contains 49-51 per cent solids by weight, and is compatible with most of the other air-drying Glyptals. It also shows compatibility with chlorinated rubber, certain soya oils, and vinyl resins.

Pigmented resin has good stability; gloss retention is also good.

(Product of the General Electric Company, Chemical Division, Dept. CP, Pittsfield, Mass. . . . or for more information check CP 2277 on handy form, pages 2 & 3.)

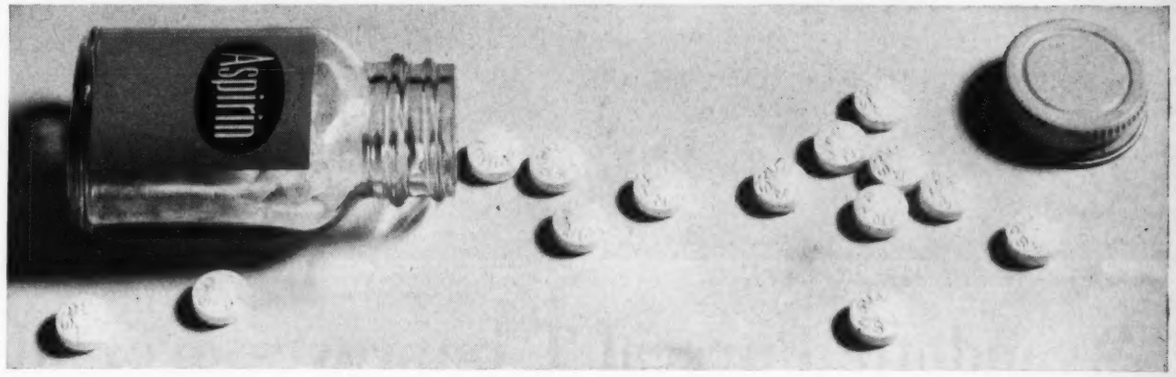
Abstracts cover German research in field of synthetic fibers

English translations of German patent applications and research papers are listed in 11-page bulletin. Abstracts cover developments from war years up to 1951 in the production of synthetic fibers. Bulletin is divided into three separate sections and lists 46 individual reports. In section on fully synthetic fibers, processes are listed for polymerization of acrylonitrile, continuous manufacture of monofilaments from high polymers, and manufacture of thick yarns from synthetic lineal condensation polymers. Latter work describes a device for spinning thick yarns of uniform diameter and free of bubbles or discoloration.

Second section describes research findings and industrial techniques in cellulose processing. One patent application pertains to process for sulfidizing soda pulp. According to bulletin, process yields a uniform xanthate with molecular chain lengths closely approaching those of the starting cellulose. Another work describes a process for purifying cellulose with "alpha-cellulose contents ranging up to 97% in yields of 82-93% of starting material."

Concluding section of bulletin is devoted to reports on manufacture of rayon filaments and staples. Topics are primarily concerned with manufacture of viscose fibers with high tensile strength and procedures for improving textile properties. Bul 65 is issued on letterhead request to Research Information Service, Dept. CP, 53 Nassau St., New York 38, N. Y.

What do aspirin tablets have in common with Barrett* Coal-Tar Chemicals?



Uniformity, of course. It's basic.

When you buy coal-tar chemicals, you need *uniformity* at a high level of quality.

When you buy from Barrett, you get *uniform* quality resulting from BARRETT'S BASIC POSITION IN RAW MATERIALS *and* NEARLY 100 YEARS OF COAL-TAR CHEMICAL RESEARCH AND DEVELOPMENT.

Barrett is Basic...in your business

Barrett Coal-Tar Chemicals

Phenols
Cresols
Cresylic Acids
Chlorinated Tar Acids
Xylenols
Pickling Inhibitors
Benzol
Toluol
Xylol
Naphthalene
Hi-Flash Solvent
Phthalic Anhydride
Dibutyl Phthalate
ELASTEX DCHP Plasticizer*
"ELASTEX" 10-P Plasticizer — (DIOP)
"ELASTEX" 50-B Plasticizer*
"ELASTEX" 28-P Plasticizer — (DOP)
Phenolic Resins
Niacin (Nicotinic Acid)
Pyridines
Picolines
Quinoline
Lutidines
Tar Acid Oils
Neutral Coal-tar Oils
Coal-tar Creosote
CUMAR Paracoumarone-Indene Resin*
Carbonex Rubber Compounding Hydrocarbon*
Bardol Rubber Compounding Oil*
Flotation Agents

Barrett

THE BARRETT DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 RECTOR STREET, NEW YORK 6, N. Y.

*Reg. U. S. Pat. Off.

In Canada: The Barrett Co., Ltd., 5551 St. Hubert St., Montreal, Que.

When inquiring check CP 2278 on handy form, pgs. 2-3

Purecal—a GR-S and dollar-saver

William M. Moser (left) and Ed Hillendahl, Pacific Tire and Rubber Company executives, inspect GR-S carcass stock containing Wyandotte PURECAL.

"Wyandotte Purecal T improves over-all quality in GR-S tire stocks"

—William M. Moser, *Development Mgr.*

Pacific Tire and Rubber Company executive tells how this Wyandotte product gives higher tear resistance and good cord adhesion in GR-S carcass stocks:

"We demand the highest quality in our products," says Mr. William M. Moser, development manager. "A great deal of our research and development work is devoted to continual improvement of quality and maintenance of high standards.

"Our tests and subsequent experience, using Wyandotte PURECAL* T in GR-S carcass stock as a reinforcing filler, have shown PURECAL to be an exceptionally fine aid to quality. With it in our carcass stock, we get higher tear resistance, good cord adhesion between plies, excellent building tack, and improved quality of GR-S stock.

"Using PURECAL in our processing, we can run 100% GR-S stock on our 4-roll calender without the necessity of regrinding the rolls."

PURECAL is becoming an increasingly important ingredient in the manufacture of a wide range of rubber products, including tires, wire insulation, fire hose, and industrial belts. For technical assistance, samples, or a free copy of "PURECAL in GR-S," write to *Wyandotte Chemicals Corporation, Wyandotte, Michigan, or phone AVenue 2-3300, Wyandotte. Offices in Principal Cities.*

* TRADEMARK

Wyandotte CHEMICALS

When inquiring check CP 2279 on handy form, pgs. 2-3

Glass fiber reinforced plastic possesses high flexural and impact strength . . .

can be compressed by hand or mechanical means to lower the bulk factor considerably

Uses: Molding compound which can be formed into variety of shapes and sizes on compression and transfer equipment now in use.

Features: Combines high impact and flexural strengths with excellent properties. Can be compressed by hand or mechanical means to lower the bulk factor considerably.

Description: Dryply Pre-Imp molding compound is a thermo-setting material consisting of a glass fiber reinforcing agent and a polyester resin. Strands of glass fiber are uniformly impregnated with polyester resin, then cut or chopped into lengths designed to utilize to full advantage the reinforcing characteristics of the glass as a molding compound. By using this technique, it is stated that a controlled high fiber to resin ratio is achieved. Some properties follow:

Dryply Pre-Imp	
Specific gravity, gm/cc	1.94
Compression ratio, bulk factor	
Loose	14
Packed	3.5-4
Compressive strength, psi	35-40,000
Tensile strength, psi	12-15,000
Flexural strength, psi	14-25,000
Notched Izod impact strength, ft lb	10-12
Water absorption, %	
24 hr at 25°C	0.05-0.09
30 days at 25°C	0.09-0.15
Dielectric strength, volts/mil	400-500
Compression molding	
Pressure, psi	500-3000
Temperature, °F	275-350
Transfer molding	
Pressure, psi	2000-7000
Temperature, °F	275-300
Cure time, min	1-5

In storage, no special precautions need be observed as regards humidity. Shelf life is 6 months or longer under ordinary conditions.

(A product of Flexfirm Products, Polyester Division, Dept. CP, 2300 N. Chico Ave., El Monte, Calif. . . . or for more information check CP 2280 on handy form, pages 2 and 3.)

Report life of 7000 minutes for perfume aromatic . . .

advantageous in formulation of perfumes for soap

Uses: Maker reports that product shows great promise as an ingredient of compounded perfumes — especially in the formulation of perfumes for soap.

Features: Has a high "life expectancy" — when one gram of the aromatic is placed on a 4 x 4" blotter and allowed to stand at room temperature, the life is estimated to be on the order of 7000 minutes. This property is advantageous in soap manufacture.

Description: Compound 77B is a clear, almost colorless liquid with a distinct and penetrating odor. It is a pure compound — not a mixture of varying composition. Aroma is said to be powerful, having been described as "earthy," "musty," "like raw potatoes," or "quinoline-like." There are similarities in its aroma to that of oil of patchouli or oil of vetiver. When used to replace one or both of these oils in several compound perfumes, there is little or no change in odor characteristics. How-

ever, it is noted in most cases that the formulation containing Compound 77B are more stable since they do not darken appreciably on aging.

Physical properties of this perfume aromatic are tabulated below:

Boiling range (10.5 mm), °C	120.5-122.0
Specific gravity (20/15°C)	0.9969
Refractive index (n20°C/D)	1.5103
Vapor pressure (20°C), mm	<0.01

Soluble in 95% ethanol, ethyl acetate, mineral oil, and acetone; insoluble in water and glycerine.

(Product of Tennessee Eastman Company, Division of Eastman Kodak Company, Dept. CP, 10 East 40th Street, New York 16, N. Y. . . . or for more information check CP 2281 on handy form, pages 2 and 3.)

Mixtures of metallic ions can be separated with complexing agent . . .

very sharp changes in amount of complexing occurs with small changes in pH

Uses: An organic compound that is capable of forming complex molecules with various metal ions in solution. Separation of very hard-to-separate mixtures of ions is possible, since very sharp changes in the amount of complexing occur with small changes in pH. The pH at which complexing starts to occur is usually different for most metal ions.

Features: 2-Thenoyltrifluoroacetone is offered as small flakes, pale to light yellow in color. Formula is $C_8H_5F_3O_2S$ and molecular weight 222.18. It is very soluble in common organic solvents, soluble in dilute sodium hydroxide, and slightly soluble in water. Metals which it may be complexed with are (symbols for sake of brevity): Th, Bi, Tl, Hf, Pb, Ce, La, Pr, Be, Al, Fe, Sr, Y, Ca, Cu, and Zr. Some physical properties are outlined below:

Boiling point, 760 mm, °C	236
Freezing point, supplied, °C	42.5-43.2
Refractive index, 46°C	1.550
Specific gravity, 46/25°C	1.402
Ionization constant, K_2	6.7×10^{-7}

(Product of The Dow Chemical Company, Midland, Mich. . . . or for more information check 2282 on handy form, pages 2 and 3.)

Color reactions of silica pigments with certain anti-oxidants

Four-page bulletin discusses color reactions between silica pigments and certain accelerators and anti-oxidants. Introductory section gives background information on the use of fine particle silica in producing colored rubber goods. Tests of various substances are summarized as to heating time, concentrations used, color changes, etc. Older anti-oxidants tested were Agerite Alba, Agerite Gel, Agerite Stalite, Flectol H, and Stabilite Alba. Newer anti-oxidants tested were alkylated phenols, Deenax, Ionol.

Results of these tests are discussed in closing section of bulletin. Intensity of color formation is reviewed in consideration of such factors as pH and the amount of oxygen available. Bulletin closes with list of five references to guide further investigation. Bul 52-1 is issued by Columbia — Southern Chemical Corporation, Dept. CP, 5th Ave. and Bellefield, Pittsburgh 13, Pa. When inquiring specify CP 2283 on handy form, pages 2 and 3.

Announcing Production of Esters...

by Celanese

n-Propyl Acetate

latest in the Celanese Series of Industrial Solvents developed especially for Performance and Economy

N-propyl acetate is the first in a series of esters to be produced by Celanese. It is a medium boiling, low viscosity solvent with a pleasant odor and excellent blush resistance. An economical replacement for such solvents as MIBK, butyl acetate-ethyl acetate combinations, and secondary butyl acetate, Celanese* n-propyl acetate is now available in 90%-92% concentration—in volume quantities to meet both large and small scale requirements.

With the addition of n-propyl acetate, Celanese can now offer a diversified line of organic solvents, providing formulators with the flexibility and economy of split shipments in compartmented tank trucks and cars at bulk prices.

Investigate the cost-saving possibilities of n-propyl acetate. A Celanese technical representative will be glad to review your formulations, and demonstrate how Celanese solvents can give you the performance you need. Write for technical bulletin N-29-1.

Celanese Corporation of America, Chemical Division, Dept. 555-E, 180 Madison Avenue, New York 16, N. Y.

Properties

Color . . . . . 15 APHA
Spec. Grav. . . . . 0.880—0.885 @ 20/20°C
Boil. Pt. . . . . 95°C—103°C
Ester Content . . . 90%—92%

Solvents by Celanese

Solvent 203	Acetone
Solvent 301	Methanol
Solvent 601	n-Propyl Acetate
Solvent 901	Butyl Alcohols

Celanese* CHEMICALS

*Reg. U. S. Pat. Off.

When inquiring check CP 2284 on handy form, pgs. 2-3

A typical Air Products high purity Oxygen-Nitrogen Generator installation in one of America's larger steel plants.

High or low purity—small or large quantities made at your plant from air

Used Today By Such Companies As:

American Chain & Cable Co., Inc.
Bethlehem Steel Co.
Copperweld Steel Co.
Thomas A. Edison, Inc.
Ford Motor Company
Granite City Steel Co.
Grede Foundries, Inc.
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National Steel Corp. (Weirton Steel Company)
Pettibone Mulliken Corp.
Pittsburgh Steel Foundry Corp.
Ross-Meehan Foundries
and U. S. Armed Services

Many of these installations have been operating constantly for years.

What are your requirements? *Pure, dry* oxygen or nitrogen, gas or liquid? *Tonnage* oxygen or nitrogen, gas or liquid? Some *combination* of these?

Whatever your needs, versatile Air Products Generators can fulfill them. Today, many installations are in operation with oxygen capacities from 200 cubic feet to 500,000 cubic feet per hour. Additional tonnage oxygen-nitrogen generators are now under construction. Equipment for virtually *any* capacity, *any* purity, and *any* pressure is available.

To find out how you can use the free air to make your own oxygen and nitrogen, talk over your requirements with Air Products Engineers. They have designed, built and put into successful operation *more than 400* oxygen-nitrogen generators. This is your assurance that Air Products equipment will (1) incorporate the most advanced cycles for your particular requirements, and (2) will do the job, and do it dependably.

AIR PRODUCTS, INCORPORATED
Dept. K, Box 538, Allentown, Pa. Emmaus 493

Specialists in Equipment for All Low-Temperature Processes

Air Products INCORPORATED
OXYGEN-NITROGEN-ARGON GENERATORS

When inquiring check CP 2285 on handy form, pgs. 2-3

Molded, extruded items serviceable at temps down to –50°C . . .

compound has good moldability, available either as fine powder or granules

Uses: Compound can be injection molded, extruded, or compression molded. Formed parts are recommended for applications at low temperatures.

Features: Has high impact strength at temperatures as low as –40 to –50°C. Moldability is good.

Description: Kralastic J is the latest addition to the standard Kralastic molding and extrusion series of compounds. It is available as a fine powder for mill or banbury mixing (EBMU-1) and as a molding or extrusion granule (K-2186-3). General properties of the latter material are set forth in the following tabulation:

Injection molding	
Temperature, °F	350-600
Pressure, psi	6000-30,000
Mold shrinkage, in/in	.002-.004
Compression molding	
Temperature, °F	300-325
Pressure, psi	1000
Mold shrinkage, in/in	.004-.005
Specific gravity	1.015
Heat distortion 2°C/min 264 psi, °F	170
Water absorption, 24 hr	0.3-0.4
Tensile strength, psi	3100
Flexural modulus, psi	140,000
Flexural strength, psi	5400
Rockwell hardness, R	62-65
Impact strength, ft lb/in notch	
25°C	6-7
0	5.5
—10	6.0
—20	6.0
—30	5.8
—40	5.2

Kralastic J is only slightly affected by light. Offers good resistance against alkalis, salts, and acids. It is soluble in ketones and aromatics, and swells in aliphatics.

(Product of the United States Rubber Company, Dept. CP, Rockefeller Center, 1230 Avenue of the Americas, New York 20, N. Y. . . . or for more information check CP 2286 on handy form, pages 2 and 3.)

Three nonionics show excellent detergent properties over wide range of conc's . . .

each is stable in both alkaline and acid media, also readily soluble in most solvents

Uses: Textile processing agents, emulsifiers, dispersants, scouring powders, antistatic agents, dust wetters, and in metal cleaning and pickling.

Features: Excellent stability to both alkalis and acids; readily soluble in most solvents, including water, ethanol, butanol, acetone, carbon tetrachloride, and linseed oil.

Description: Hercules B-48 is a clear, amber-colored viscous liquid. It is a polyethylene glycol ester of rosin. Product B-79 is a clear, pale straw-colored viscous liquid. It is a polyethylene glycol ether of an alkylated phenol. This product has the greatest surface activity of the three. Possessing intermediate surface active properties is nonionic B-97. It is an ester-ether type of material.

These three nonionics exhibit excellent detergent properties over a wide range of concentrations. They normally

have only a slight odor, but odor-free grades can be supplied upon request. Their density is slightly heavier than water and their viscosity at room temperature is considerably higher than water, but they flow freely when warmed.

(Available from Hercules Powder Co., Dept. CP, Wilmington, Del. . . . or for more information check CP 2287 on handy form, pages 2 and 3.)

Of value as plasticizer for chlorinated rubber and polyvinyl chloride . . .

improves water resistance, is relatively non-volatile and has excellent heat stability properties

Uses: Plasticizing chlorinated rubber as well as swelling both the crude and vulcanized forms. It has been tested industrially as a secondary plasticizer in polyvinyl chloride compositions and is used as a mold lubricant for phenolformaldehyde and shellac molding compounds.

When used in cellulose nitrate and acetate with a solvent type plasticizer, it improves gloss and water repellency. Additionally, it acts as an excellent solvent for ester gum, dammar, coumarone and cyclohexanone resins.

Features: Excellent heat stability and dielectric properties.

Description: Witco Methylcyclohexyl Stearate is a stable ester mixture of the three isomeric methylcyclohexyl stearates. It is a clear, straw-yellow, oily liquid which solidifies at temperatures below 10°C and is relatively non-volatile.

TYPICAL PROPERTIES	
Molecular weight	380
Boiling range, 4 mm Hg	220-240°C
Melting point	10°C
Specific gravity	0.890
Pounds per gallon, 68°F	7.31
ANALYSIS	
Color, APHA	150
Acidity, as stearic, %	0.1
Ester content	99.0
Flash point	338°F

(Available from Witco Chemical Co., Dept. CP, 295 Madison Ave., New York 17, N. Y. . . . or for more information check CP 2288 on handy form, pages 2 & 3.)

Properties of isobutyl solvents for lacquer formulations

Six-page bulletin compares properties of isobutyl acetate and isobutyl alcohol with their normal butyl homologues in regard to use in lacquer formulations. Relative evaporation rates of isobutyls versus normal butyl acetate and alcohol are compared. Dilution ratios extend the comparison with respect to toluene and V.M. & P. naphtha. Tables shows the effect on viscosity when isobutyl acetate is substituted for normal butyl acetate in solutions containing various resins and polymers.

Two-color bulletin indicates that isobutyl acetate and isobutyl alcohol may be interchanged with normal butyl solvents in furniture and automobile finishes, hot spray lacquers, and specification dopes without altering desired surface characteristics. Summary concludes booklet with suggestion that these solvents can be used for preparing reducers, lacquer thinners, and solvent blends. "Isobutyl Alcohol — Acetate" is issued by Tennessee Eastman Company, Dept. CP, Kingsport, Tenn. When inquiring specify CP 2289 on handy form, pages 2 and 3.

LONG ON EXPERIENCE

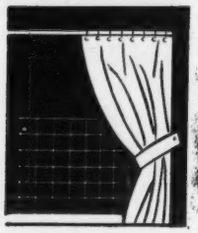
for over fifty years, NIAGARA has been producing top quality electro-chemicals... pioneering in the commercial production and application of a group of them.

NIALK®	Liquid Chlorine
NIALK	Caustic Potash
NIALK	Carbonate of Potash
NIALK	Paradichlorobenzene
NIALK	Caustic Soda
NIALK	TRICHLORethylene
NIAGATHAL®	(Tetrachloro Phthalic Anhydride)

NIAGARA ALKALI COMPANY
60 East 42nd Street, New York 17, N. Y.

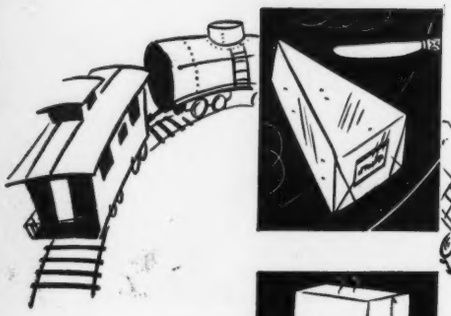
When inquiring check CP 2290 on handy form, pgs. 2-3

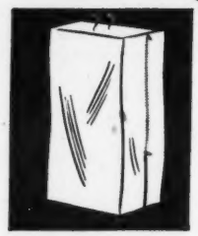
An Ideal Travelling Companion for VINYLS



ACETYL TRIBUTYL CITRATE

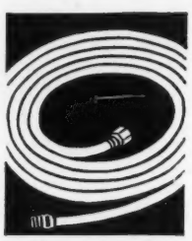
A NON-TOXIC PLASTICIZER





CONSIDER THESE QUALITIES WHICH MAKE ACETYL TRIBUTYL CITRATE A HIGHLY DESIRABLE PLASTICIZER FOR VINYL SHEETING, FILM, AND EXTRUSION COMPOUNDS:

- NON-TOXIC
- LOW VOLATILITY
- SUPERIOR LIGHT and HEAT STABILITY
- HIGH COMPATIBILITY



Acetyl Tributyl Citrate is a clear, water-white liquid, soluble in most organic solvents. It has a high boiling point—172-4°C at 1 mm Hg—and is insoluble in water. This plasticizer is highly compatible with vinyl polymers and copolymers. In vinyl compounds, its use results in improved heat and light stability. Extensive tests have proved it to have a very low order of toxicity, making it ideal as a plasticizer for food packaging material.

For additional information about Acetyl Tributyl Citrate and other Pfizer Citrate Plasticizers write for the booklet "Pfizer Citric Acid Esters as Plasticizers."

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630 Flushing Ave., Brooklyn 6, N. Y.

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Manufacturing Chemists for Over 100 Years

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When inquiring check CP 2291 on handy form, pgs. 2-3

MATERIALS

Water soluble resins apply to oil, plastics, paper, and paint fields . . .

good heat, chemical, oil, solvent, and bacteria resistance

Uses: Series of water-soluble, modified styrene polymer resins especially useful to the oil, plastics, paper, and paint fields. Suitable for application as parting agents in plastics molding operations, as oil well mud additives to retard water filtration losses, as paper coatings, and as stable colloids for water paints.

Applicability extends to sizing, finishing, printing, and coating of textiles; as a dry or green strength binder for ceramics; and as tack promoters, film formers, and viscosity builders for adhesives.

Features: Have high heat resistance, non-thermoplasticity, and resistance to chemicals, oils, and solvents. These characteristics are of particular advantage during plastics molding and paper coating operations. Added feature of bacteria resistance and dispersion properties help retard sedimentation rate of clay in oil well uses.

Description: Lustrex X-700 Series water-soluble resins are finely divided, free-flowing, off-white powders that produce stable solutions in water covering a wide viscosity range. All in the series pass 40 mesh, with more than 90% passing 100 mesh screen. Odor is slight. Properties are set forth below:

	X-710 (Crude)	X-710 (Pure)	X-770 (Crude)	X-770 (Pure)	X-7400 (Pure)
Volatile (max), %	3	3	3	3	3
Specific gravity	1.4	1.35	1.4	1.35	1.35
Bulk density, gm/cc	0.5	0.4	0.5	0.4	0.4
Active salt (volatile free basis), %	80	100	80	100	100
Molecular weight of base polymer	10,000	10,000	70,000	70,000	400,000

(Products of The Monsanto Chemical Company, Merrimac Division, Everett Station, Boston 49, Mass. . . . or for more information check CP 2292 on handy form, pages 2 and 3.)

Excellent high temp prop's and electrical resistance typify oil, grease and wax line . . .

offer inertness to action of concentrated nitric acid, aqua regia, hydrogen peroxide, etc

Uses: Plasticizers, sealing mediums and lubricants.

Features: High electrical resistance, thermal stability up to temperatures of the order of 450°F, non-flammable, and inert to chemical attack.

Description: Kel-F oils, waxes and greases are a series of low molecular weight materials. Five different products, ranging from light oil to hard wax, have been formulated and are available in commercial quantities. Following are product designations:

1	light oil
5	medium oil
10	heavy oil
40	grease
150	wax

It is stated that products offer high resistance to action of concentrated nitric acid, aqua regia, hydrogen peroxide, high pressure oxygen, and other strong oxidizing agents. They are similarly inert to alkalis. These

products are also relatively insoluble in polar solvents. Their insolubility in non-polar solvents is similar to, but less than, chlorinated compounds, hydrocarbons, etc. (Products of The M. W. Kellogg Co., Dept. CP, P.O. Box 469, Jersey City 3, N. J. . . . or for more information check CP 2293 on handy form, pages 2 and 3.)

Shortened curing cycle reported for latest alkyd coating resin . . .

has all advantages of usual short-oil-length pure alkyds plus greater hardness, chemical resistance

Uses: Dehydrated-castor-oil-containing alkyd for coating formulations, especially baking enamels.

Features: Shortened curing cycle is perhaps the most outstanding attribute of this resin — air dries (77°F) dust free in ¼ hr and hard in 7 hr. Baking schedule is 6 min @ 350°F and 30 min @ 250°F.

Possesses all the advantages of an ordinary short oil length pure alkyd (oxidizing type) plus greater hardness with equal flexibility, greater chemical resistance, high gloss, better color retention, and improved heat resistance.

Description: Specifications of No. 1343 Beckosol are set forth in the following table:

Type	Pure drying alkyd
Non-volatile, %	49-51
Volatile, %	95 Xylol — 5 butanol
Viscosity (G-H)	W-Y
Color (Gardner-1933)	3-7
Acid number	5-10
Specific gravity solution	0.990-1.000
Lb/gal solution	8.25-8.33
Lb/gal non-volatile (calc)	9.84-9.94
Phthalic anhydride (ASTM Des. 563-45T), min on non-volatile, %	43
Type of oil	Dehydrated castor
% Oil on non-volatile (calc)	35
Mineral spirits tolerance, %	100
Rosin and/or derivatives	None
Phenolic resin modifiers	None
Suggested thinner proportions, coal tar, %	100
Compatibility with	
Pigment	Good
Nitrocellulose	Fair
Miscibility with	
Drying oils	None
Varnishes	None

(Product of Reichhold Chemicals, Inc., Dept. CP, International Building, Rockefeller Center, New York 20, N. Y. . . . or for more information check CP 2294 on handy form, pages 2 and 3.)

Safety rules to observe when handling chromic acid

Twelve-page data sheet suggests safe procedure to follow when handling or using chromic acid (chromium trioxide). Correct methods are described for shipping, labeling, storing, and unloading containers. Several precautions are listed which should be observed to protect personnel who handle CrO_3. Data sheet also discusses personnel protective equipment, employe education, and first aid or medical treatment in emergencies.

Chromic acid is classified by ICC as an oxidizing material, and its power is intensified in presence of other strong acids. Concentrated solutions at elevated temperatures attack common metals. Data Sheet SD-44 is issued by Manufacturing Chemists' Association, Inc., Dept. CP, 15th and H St., Washington 25, D.C.

DU PONT ANNOUNCES ...A NEW LOW PRICE FOR "ELVANOL"

GRADE 72-51 ... HIGH VISCOSITY
GRADE 71-24 ... MEDIUM VISCOSITY

POLYVINYL ALCOHOL

Price reductions on these two large-volume grades of "Elvanol" have been made possible by new and improved manufacturing techniques. The price of other "Elvanol" grades has not been affected

Check These Outstanding Properties of "ELVANOL"—the Versatile, High-Strength Resin

WATER SOLUBLE—dissolves easily in hot or cold water, depending on the type and grade. No need for expensive organic solvents.

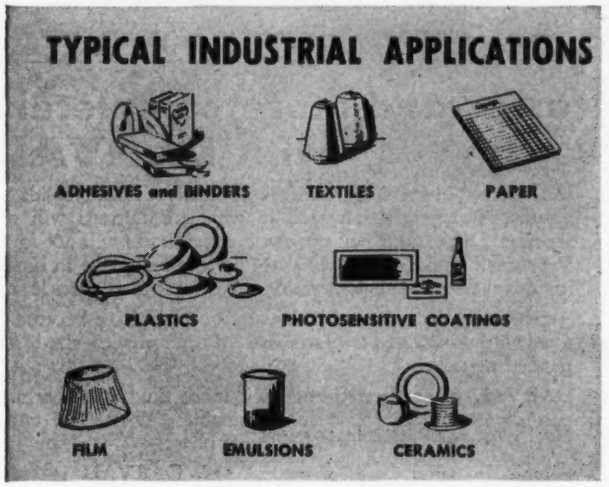
RESISTANCE TO GREASES AND COMMON ORGANIC SOLVENTS—impervious to air and many other gases. Such properties are extremely useful in industrial applications.

HIGH STRENGTH AND FLEXIBILITY—characteristics not often found in a water-soluble resin. Tensile strength and flexibility can be varied with plasticizers.

EASILY MODIFIED with plasticizers, extenders, gelling agents, colors, flame-retardants, etc.

SEVERAL GRADES OF "ELVANOL" are available, each with different physical properties, permitting a selection of the grade best suited to specific requirements.

TYPICAL INDUSTRIAL APPLICATIONS



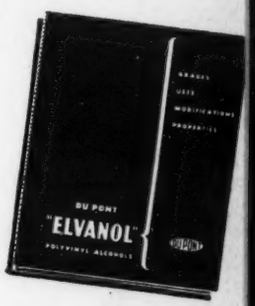
THIS FREE 44-PAGE BOOK TELLS YOU:

WHAT "Elvanol" is—physical and chemical properties.

WHERE "Elvanol" can be used—industrial applications.

HOW "Elvanol" can be modified for a particular use.

WHICH "Elvanol" grades are available for general or special uses.



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BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

When inquiring check CP 2295 on handy form, pgs. 2 & 3.

Imagineer this!

POLYAMIDE RESIN

Properties:

Low melting point . . . excellent gloss . . . excellent resistance to water and water vapor — greases and oils . . . non-blocking . . . heat sealability.

Thermoplastic resin applicable as a hot melt, from organic solvents, from water dispersions.

Write for data sheet covering: prices, information on samples, specifications, properties and suggested formulations.

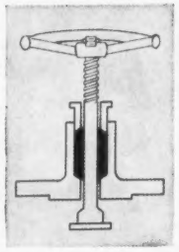
GENERAL MILLS, INC.

Research Laboratories, Dept. D,
2010 E. Hennepin Ave.,
Minneapolis Minnesota

When inquiring check CP 2296 on handy form, pgs. 2-3

Du Pont Teflon is inert to almost all chemicals*

Tough Du Pont plastic resists heat up to 500° F. . . . has zero water-absorption : : : unique non-adhesive properties



Du Pont "Teflon" tetrafluoroethylene resin is superior in chemical resistance to any other known gasket or valve-packing material. It has lasted up to 300 times longer than conventional materials.

"Teflon" resists attack of all corrosive chemicals (except fluorine under extreme conditions, and molten alkali metals) . . . has a low coefficient of friction and zero water-absorption. It serves well in temperatures from -320°F. to 500°F., under pressures up to 30,000 lbs/in². The unusual non-adhesive properties of "Teflon" make it ideal for uses where a non-sticky surface is needed.

"Teflon" is used in gaskets, packing for pumps, valves, pistons and agitators . . . as an insulating material for generators, motors, high-temperature and high-voltage wires and cables.

We suggest you investigate the properties of "Teflon." Du Pont supplies "Teflon" in the form of molding powders and aqueous dispersions. We'll suggest names of suppliers of sheets, rods, tubes or finished parts. For information, write:

*REG. U.S. PAT. OFF.

E. I. du Pont de Nemours & Co. (Inc.)
Polychemicals Dept., District Offices:
350 Fifth Avenue, New York 1, N. Y.
7 S. Dearborn St., Chicago 3, Ill.
845 E. 60th St., Los Angeles 1, Cal.

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. . . THROUGH CHEMISTRY

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disperse faster and more completely with DARVAN

DARVAN* dispersing agents keep finely divided solids or liquids permanently dispersed in water. Emulsions will not separate. Dispersions will not settle. Precipitates will not form. Very small amounts of DARVAN are even effective in breaking down flocs and agglomerations to their ultimate particle size.

Active ingredients in emulsions are more effective because of the greatly increased surface area of the smaller sized suspended particle.

DARVAN makes pastes smoother, more fluid. Concentrated pastes with higher solids are obtainable. DARVAN emulsifies oils where water is the external phase.

Soluble in water, with a neutral pH, DARVAN is stable toward mild acids and alkalis.

DARVAN is constantly finding new applications in many products of the Chemical Industry. It may solve your particular problem. Write today for detailed information.

*DARVANS are dispersing agents, not wetting agents. DARVANS do not appreciably affect surface tension.

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SPECIALTIES V DEPARTMENT
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NAME_____

POSITION_____

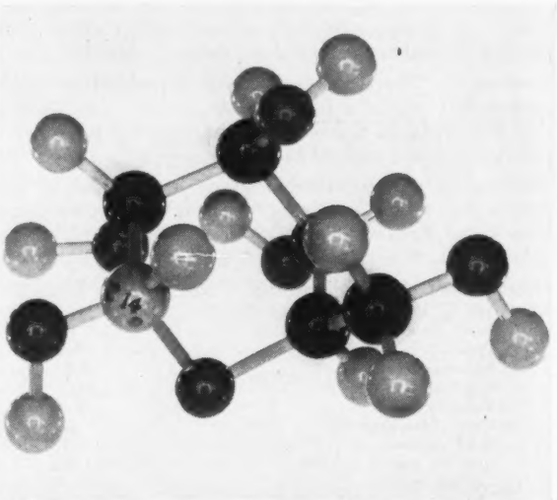
(Please attach to, or write on, your company letterhead)

When inquiring check CP 2298 on handy form, pgs. 2-3

C-14 now positioned specifically within molecules of sugars and sugar derivatives . . .

technique employed results in better yield with corresponding greater availability

Sugars and sugar derivatives having radioactive carbon atoms located in specific positions within the molecule have been prepared by the National Bureau of Standards for the first time in good yield and high activity. Development of procedure for synthesizing the sugars is result of program on radioactive carbohydrates now



Atomic model of glucose molecule showing the labeled C-14 atom in position 1 of the carbon chain. Remaining carbon atoms are represented by black spheres

being conducted by Dr. H. S. Isbell and associates of the NBS staff under sponsorship of the Atomic Energy Commission.

Prior to this, introduction of a "tagged" carbon at a specific point within the sugar molecule was not only

Relatively weak beta radiation of C-14 is measured before samples are weighed and distributed. A formamide solution containing a known concentration of the radioactive sugar is being introduced into the counter by means of a capillary pipet

a difficult process, but also prohibitively expensive. Yields were less than 10% of recoverable radioactive material, and in most cases the products were only weakly radioactive. Now, with the improved method, 13 different position-labeled sugars or sugar derivatives have been prepared by NBS. Some are available for distribution; others will soon be made available.

Preliminary studies indicated the probability that the low yields obtained by previous investigators were due in part to use of macro procedures on a semi-micro scale. Each step was therefore modified for use at the millimole level, and a number of improvements were affected.

In the preparation of labeled glucose, the sugar is first oxidized to D-arabinose. Reaction of the latter with sodium cyanide containing C-14 yields two cyanohydrin epimers which are hydrolyzed to give a mixture of gluconic and mannonic acids. Upon separation, the gluconic acid is converted to the corresponding lactone and then reduced to the labeled glucose. In similar type reactions, the mannonic epimer yields mannose.

For most tracer applications, labeled glucose is desired. However, in the classical cyanohydrin synthesis, the mannose product predominates over the glucose. It was found that the reaction of D-arabinose with cyanide can be controlled by the presence or absence of general acid catalysts so that either of the two products predominate. This discovery made possible an increased yield of labeled glucose.

Previous procedure with respect to hydrolysis was also improved upon. Decomposition that occurred at higher

Lactone containing C-14 is reduced to the corresponding radioactive sugar by adding sodium amalgam slowly through a side tube while the buffered lactone solution is stirred mechanically in an ice bath

temperatures was avoided by effecting hydrolysis under milder conditions. The cyanohydrin was heated in sodium carbonate solution at 60°C for several hours with aeration and concentration of the solution.

Perhaps the most significant improvement was in the final step — reduction of sugar acid lactone to the sugar. Efficiency of the reaction was increased by the development of a sodium amalgam of uniform composition that can be conveniently handled in small quantities without undue contamination from the atmosphere. Chemical

(*Continued on next page*)

For 25 years McKesson and Robbins' formula for Glycerine suppositories has remained unchanged. Public confidence in Glycerine as an effective ingredient has been thoroughly demonstrated by the wide acceptance of this product as a familiar "medicine cabinet" accessory.

FULLY ACCEPTED... FULLY AVAILABLE IN ALL GRADES!

U.S.P. Glycerine—in children's and adult suppositories—has long been an indispensable ingredient among drug manufacturers . . . primarily for its mild stimulating and lubricating qualities.

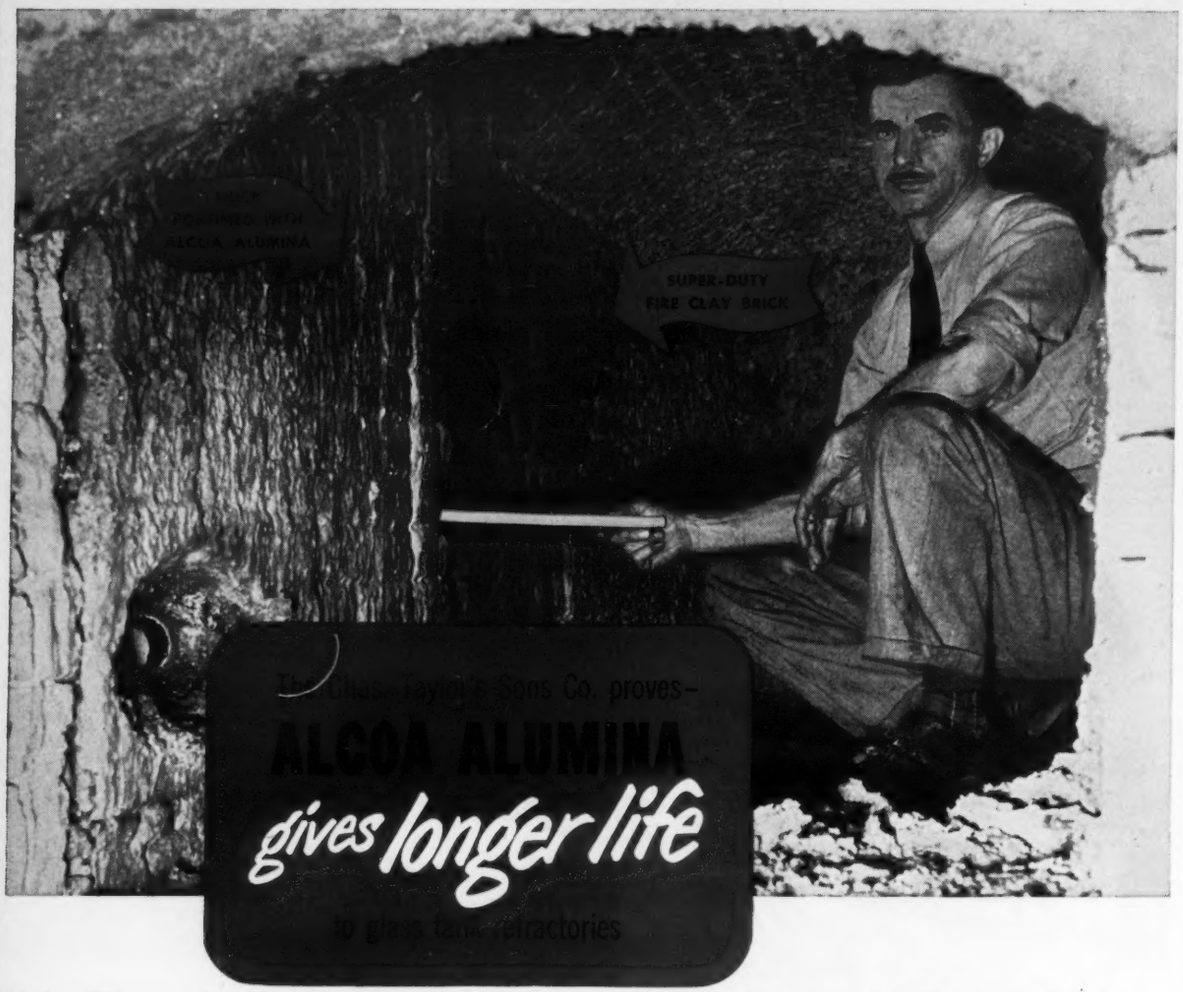
But versatile Glycerine often contributes a great many more advantages to jelly- or emulsion-based preparations of this type. For instance, its hygroscopic action keeps the mixture from drying out. It's a natural plasticizer. And in salves for topical use, U.S.P. Glycerine acts as an ideal solvent for the medicament.

Hundreds of applications in a host of proprietary pharmaceuticals attest to the fact that Glycerine has won the trust of American consumers over the years . . . that its presence on your label is accepted instantly . . . that it is widely recognized as a product which can be safely applied internally or externally. We've outlined some of these applications in a booklet, "Why Glycerine for Drugs and Cosmetics?" Write for your copy—today!

GLYCERINE PRODUCERS' ASSOCIATION

295 Madison Avenue, New York 17, N. Y.

When inquiring check CP 2299 on handy form, pgs. 2-3



Taylor Sillimanite-Fortified (Tasil-F) refractories*—widely used in the glass and metallurgical industries for those critical furnace areas subjected to batch carry over or fluxes at high temperatures—are fortified with ALCOA Alumina.

This photo shows the excellent condition of Taylor Sillimanite-Fortified (with ALCOA Alumina) brick and burner block in the back port of a cross-fired continuous glass container tank. After 276 operating days, the Tasil-Fortified (Tasil-F) brick extended 2½" to 3" beyond the adjacent super-duty fire clay brick. Note also that the burner opening or throat changed very little in either shape or dimension. This tank melted alternately flint and opal glasses at approximately 2700°-2750° F. for a total of 78 days on flint, 198 on opal. Total combined production was 11,131 tons consisting of 8,251 tons opal and 2,880 tons flint.

Bricks and shapes fortified with ALCOA Alumina are outstanding for high hot load strength and volume stability at temperatures above 2900° F. Their higher operating efficiency for the entire life of the refractory actually makes them the most economical to buy.

We do not make refractories, but we will gladly refer you to reliable sources. Write to: ALUMINUM COMPANY OF AMERICA, CHEMICALS DIVISION, 606E Gulf Building, Pittsburgh 19, Pennsylvania.

Manufactured by The Chas. Taylor's Sons Co., Cincinnati, Ohio, "Refractorers to industry since 1864."

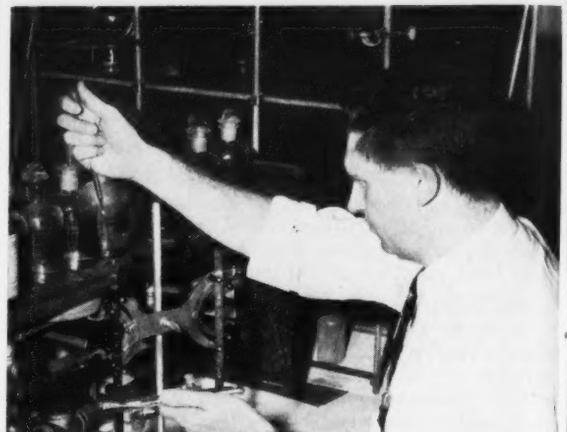
Alcoa Chemicals

ALCOA

ALUMINAS and FLUORIDES

ACTIVATED ALUMINAS • CALCINED ALUMINAS • HYDRATED ALUMINAS • TABULAR ALUMINAS • LOW SODA ALUMINAS ALUMINUM FLUORIDE • SODIUM FLUORIDE • SODIUM ACID FLUORIDE • FLUOBORIC ACID • CRYOLITE • GALLIUM

When inquiring check CP 2300 on handy form, pgs. 2-3



At several stages of the process, the aqueous reaction mixtures are de-ionized by passage through columns of ion-exchange resins

procedures were also devised for removing the neutralizers from the sugar solutions. Ion-exchange resins are used to de-ionize the aqueous solution that remains after the sodium-amalgam reduction, and the sugars are finally crystallized from alcoholic solutions.

Through use of the improved methods, either D-glucose-1-C^{14} (C-14 in the 1 position of the glucose chain) or D-mannose-1-C^{14} can be obtained in over-all yields of 50%, with a total radiochemical yield of D-glucose and D-mannose together of at least 60%.

In addition to labeled D-glucose and D-mannose, the following C-14 labeled sugars (in the 1 position) have been prepared and are available for distribution in limited quantity: D-arabinose, D-ribose, D-galactose, and lactose. The sugars are usually supplied at an activity level of about one microcurie per milligram.

(Information received from National Bureau of Standards, U.S. Department of Commerce, Washington 25, D.C.)

Points to safe handling of acetaldehyde

Safety data sheet summarizes physical and chemical properties of acetaldehyde. Sixteen-page review points out hazards and recommends precautionary measures in all phases of handling and use. Data sheet emphasizes safety requirements to be observed in shipping and storage.

Personnel safety is discussed in relation to toxic vapor effects. Booklet contains detailed first aid instructions for treating eye, nose, throat, and respiratory tract irritations. Engineering controls, ventilation, and equipment are discussed in relation to volatile properties of acetaldehyde. Safety data sheet SD-43 is issued by Manufacturing Chemist's Association, Dept. CP, 246 Woodward Bldg., Washington 5, D. C. When inquiring specify CP 2301 on handy form, pages 2 and 3.

Announce production of two organic peroxides . . .

benzoyl and lauroyl peroxides — former is safely handled

Two products are new with this manufacturer of organic peroxides — benzoyl peroxide and lauroyl peroxide.

The benzoyl peroxide product, designated as Cadox BCP, is reported to be a safe mixture containing 35% active ingredient with an inert filler. It is a white, free flowing powder, and can be handled without special precautions. Besides offering a safety feature to the user, Cadox BCP is a good source of finely divided peroxide wherever the filler will not interfere.

The lauroyl peroxide is produced from a good grade of commercial lauric acid and contains a minor amount of diacyl peroxides of higher molecular weight. Active oxygen (minimum) is 3.75%.

It is suggested as a catalyst for polymerization of vinyl monomers, as a bleaching agent for oils, fats, and waxes, as a drying agent for unsaturated oils, as a pharaceutical and cosmetic ingredient, and as a raw material or catalyst for organic syntheses. (Products of the Cadet Chemical Corporation, Dept. CP, 205 Chicago Street, Buffalo 5, N. Y. . . . or for more information check CP 2302 on handy form, pages 2 and 3.)

More stable form of sodium sulfide — pentahydrate . . .

won't melt, discolor at temperatures up to 90°C

Development of a more stable sodium sulfide — a new pentahydrate form — has been announced by the J. T. Baker Chemical Company.

Containing only 5 molecules of water, the improved reagent will not melt or discolor during storage at temperatures up to 90°C. This is in direct contrast to the customary form of sodium sulfide — containing 9 moles of water that often melted in its own water of crystallization at 35-45°C.

The new pentahydrate sodium sulfide is offered as dry crystals, easily handled and weighed. It dissolves in water to form a clear colorless solution. (J. T. Baker Chemical Company, Dept. CP, Phillipsburg, N. J. . . . or for more information check CP 2303 on handy form, pages 2 and 3.)

For more information on product advertised at right, specify CP 2304 . . . see information request blank between pages 2-3.

Count on HEYDEN for FORMIC ACID

More and more chemists and production men are specifying Heyden Formic Acid (90% and 85%) to assure best results in a wide variety of applications.

Make the most of this high quality formic acid in your particular process. In the manufacture of better textiles, be sure you are taking advantage of the economies and improvements it effects in its many uses.

Heyden Formic Acid has proved its value in the production of important pharmaceuticals—in the tanning of leather—in the treatment of paper—in rubber manufacture—in metal plating and numerous other industrial applications.

Shipped in 125 lb. carboys and 525 lb. stainless steel drums.

SODIUM FORMATE

Another Heyden product of high purity that is important in the chrome tanning of leather, making water-resistant wall paper, and dyeing and finishing of textiles. Investigate this economical raw material for your operations. Shipped in 300 lb. water-proofed fiber drums.

FINE HEYDEN CHEMICALS

Serving Industry through Finer Chemicals

HEYDEN CHEMICAL CORPORATION

393 Seventh Avenue, New York 1, N. Y.

CHICAGO • PHILADELPHIA • SAN FRANCISCO • DETROIT • PROVIDENCE

Benzaldehyde • Benzoates • Benzyl Chloride
Bromides • Chlorinated Aromatics
Creosotes • Formaldehyde • Formic Acid
Glycerophosphates • Guaiacols
Hexamethylenetetramine • Medicinal Colloids
Methylene Disalicylic Acid • Paraformaldehyde
Parahydroxybenzoates • Penicillin
Pentaerythritols • Propyl Gallate • Resorcinol
Salicylates • Salicylic Acid • Streptomycin

Announce improved melamine molding compound — it's mineral filled . . .

tell how it can be compression and transfer molded

Improved electrical, physical, and chemical characteristics are reported for a new melamine molding compound — mineral filled Melmac 592.

Mineral-filled melamine has excellent high-frequency preheating characteristics, and once heated to a temperature of 250°F in any standard high-frequency unit, the material will have a flow sufficiently long for transfer or plunger molding. Such preheating will also aid in compression molding.

Although it can be compression molded satisfactorily if properly handled, this technique is not used extensively because most of the parts which are produced are quite complicated in structure, entailing molds with fragile pins and other components. For this reason, plunger or transfer molding is used in order to avoid mold breakage due to excessive pressure on weak mold parts. If compression molding is used, the recommended mold temperature is in the neighborhood of 300°F, with a molding pressure varying from 1000-6000 psi.

With commercially accepted molds there is little difficulty encountered in transfer or plunger molding. Chrome plating of the mold is recommended, and complete coverage of the surface of the mold is advisable. Certain mold designs sometimes require a deep dead-end channel or tower. With such molds, fouling may be encountered even to the point of having the thin, long molded section break off and stick in the mold. If the broken part will not "mold out," it will be necessary to remove the die from the press, dig the piece out, and subsequently repolish the mold.

Mold fouling is accentuated by the presence of moisture in the molding material. If fouling continues, and undercuts are not present in the fouled section of the mold, it is recommended that the mold temperature be gradually lowered until sticking is eliminated. Adequate venting in deep recesses of the mold is also highly recommended. Pot and mold temperature should be between 275 and 340°F. Plunger or transfer ram pressure will vary over a wide range from 4000 to 20,000 psi.

(Product of the American Cyanamid Company, Dept. CP, 30 Rockefeller Plaza, New York 20, N. Y. . . . or for more information check CP 2305 on handy form, pages 2 and 3.)

No need for concern over glycerine curtailment during '52, group reports . . .

supply will allow seeking new horizons and extended applications of material in new fields

A glycerine supply situation which will permit effective advance planning without user concern as to "emergency" alternatives is foreseen for the remainder of 1952, on the basis of current stocks and production trends, the Glycerine Information Service reports.

Synthetic glycerine production this year will assist in maintaining a situation in which buyers can avoid "subject-to-change" specifications for their glycerine-containing products. The 1951 production level of 211.3 million pounds, although 7% less than the 1950 all-time high, proved adequate to meet both normal and special defense requirements, the report stated.

Applications for which USP glycerine is favored, because

MONSANTO
CHEMICALS — PLASTICS

FOR YOUR INFORMATION

Every month Monsanto publishes these pages of pertinent information which may be helpful to you. This issue discusses:

Mildew Proofing
Ortho-Nitrochlorobenzene
Sulfuric Acid Plant
Plasticizers
Corrosion-preventing Paper
Dessert Recipes
Pilotite S-5
Maintenance Paints
Biological Resistance
Sodium Tripoly Phosphate
Tetra Sodium Pyrophosphate
Phosphoric Acid

Additional information on any of these subjects will be provided by any Monsanto Sales Office in response to your request by coupon or letter.

Putting the right qualities in adhesives for bags, bottles or books

The trend is away from the old-fashioned glue pot. It's toward the modern adhesives that give efficient bonding between widely varied materials and meet the needs of high-speed machines for labeling, sealing or fabricating.

You can select the qualities you want in adhesives for bags, bottles or books by choosing a Monsanto Plasticizer. In the large family of Monsanto Plasticizers you'll find one or more to exactly fit your needs whether you're making hot-melt, tacky, nontoxic or heat-sensitive adhesives.

Monsanto Plasticizers serve in adhesives based on polyvinyl acetate, polyvinyl chloride, zein, casein, polyvinyl butyral, styrene, ethyl cellulose and polyvinylidene chloride.

When your customers call for adhesives to meet their special needs, investigate the qualities you can attain by using Monsanto Plasticizers. For information on the use of Monsanto Plasticizers, which are available for prompt delivery, contact the nearest Monsanto Sales Office or mail coupon.

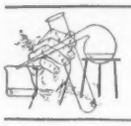
MONSANTO PLASTICIZERS FOR QUALITY ADHESIVES

For Tacky Adhesives:
Ortho-Nitrobiphenyl
Dimethyl Phthalate
Dibutyl Phthalate
Santicizer* 140
Santicizer 160
Santolite* MHP
Santolite MS (80%)
Tricresyl Phosphate
Triphenyl Phosphate

For Heat-Sensitive Adhesives:
Diphenyl Phthalate
Santicizer 1-H
Santicizer 3
Santicizer 9

For Hot-Melt Adhesives:
Dibutyl Phthalate
Diphenyl Phthalate
Santicizer 160
Santicizer 8
Santicizer M-17

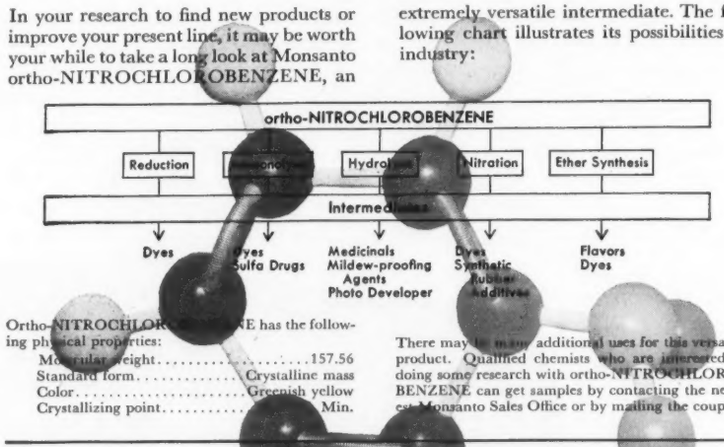
For Nontoxic Adhesives:
Santicizer 141
Santicizer B-16
Santicizer E-15



Research Chemists' Corner

You may find something new here

In your research to find new products or improve your present line, it may be worth your while to take a long look at Monsanto ortho-NITROCHLOROBENZENE, an extremely versatile intermediate. The following chart illustrates its possibilities in industry:



Ortho-NITROCHLOR NE has the following physical properties:

Molecular weight	157.56
Standard form	Crystalline mass
Color	Greenish yellow
Crystallizing point	Min.

There may be many additional uses for this versatile product. Qualified chemists who are interested in doing some research with ortho-NITROCHLORO-BENZENE can get samples by contacting the nearest Monsanto Sales Office or by mailing the coupon.

Is "The Mrs." worried about the length of your belt?

You don't have to give up sweets just because your waistline is getting to the point where your wife is worried about the length of your belt. Just have her make desserts sweetened with Monsanto Saccharin. She doesn't know how? Well, mail the coupon and we'll send you a copy of the Monsanto recipe book. It contains nearly a score of recipes for delicious dishes sweetened with nonfattening saccharin.

Monsanto laboratories develop method of mildew-proofing vinyls

Monsanto Research has developed a new method of incorporating Milmer* 1 into vinyl coatings. The process, which is easy to use, permits the inclusion of Milmer 1 without crocking or blooming in calendered, plastisol, organosol and solvent coatings. It may be put into the coatings, the fabric or both.

Milmer 1 is effective in controlling mildew in both supported and non-supported vinyls.

Large quantities of Milmer 1 now go into coated fabrics for military use. It is employed in vinyl-coated duck and complies with many government specifications, including: MIL-F-4143, MIL-D-10860, KK-L-136B, 24-C-20, MIL-P-3003, MIL-F-6107, MIL-D-10799, MIL-T-10168A, MIL-P-10404, and MIL-C-5462A.

Peacetime uses of Milmer 1 in coated fabrics include tents, tarpaulins, upholstery, collapsible boats, collapsible tanks, irrigation dams and numerous others.

If you are interested in preventing mildew in vinyl coatings, sheeting or insulation, investigate the Monsanto method of using Milmer 1. You can get complete details from the nearest Monsanto Sales Office or by mailing the coupon.

Protection for metal parts

In the past, machine guns and metal parts of other military equipment shipped to Korea have been protected in transit by a heavy coating of grease. Removal of this grease has been one of the most tiresome of details . . . a detail no longer necessary, thanks to chemistry. A patented wrapper, in which Monsanto Dicyclohexylamine is used, prevents corrosion. For sources of supply, mail the coupon.

Monsanto planning to build 250-ton sulfuric acid plant

Working with Tide Water Associated Oil Company, Monsanto is planning construction of a jointly owned, 250-ton sulfuric acid plant at Avon, California. The plant

will employ the Monsanto-Ross-Wilde process of recovering water-white acid from petroleum sludge acids.

Refinery wastes, sludge and hydrogen sulfide will be piped from the adjacent Tide Water Associated Oil Company refinery. Most of the sulfuric acid produced will be piped back to the refinery where it will be used in processing aviation gasoline and other petroleum products. Any surplus will be sold to West Coast industries.

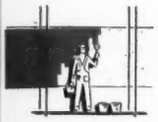
The Monsanto-Ross-Wilde process is a flexible, low-temperature method of recovering acid from refinery wastes. It recovers a high percentage of acid in the petroleum sludge, forming a gas that is higher in sulfur content than that obtained by burning elemental sulfur which now is in short supply.

If you are interested in constructing a similar plant, you may consult Monsanto Engineers without cost or obligation. For complete details, mail the coupon.

AROCLORS

IN PLENTIFUL SUPPLY

Additional capacity, now completed, makes the AROCLORS* (chlorinated biphenyl and chlorinated polyphenyls) freely available . . . Some uses of the AROCLORS are included on this page —Technical Bulletins are available dealing with structural and application data. See coupon for listing.



Pliolite S-5 and AROCLORS

Used as standard plasticizers and resin extenders, the AROCLORS contribute fast-drying properties to Pliolite S-5—provide excellent protection against acids and alkali, moisture and other common corrosive influences. Widely applied to protective and decorative coatings for concrete and steel structures, railway tank cars, concrete floors and walls, stucco construction, wood and metal marine equipment.

Maintenance paints and AROCLORS . . . Other applications

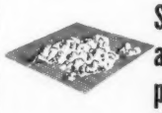
The destructive action of water, acids, alkali and other corrosive influences are effectively resisted by metal-surface paints that are formulated with AROCLORS. These Monsanto chlorinated biphenyl and chlorinated polyphenyls also contribute nonflammability, superior adhesion, high gloss. In addition, the AROCLORS possess good electrical properties . . . Besides their application to paints, the AROCLORS are used in formulating modified and synthetic rubber coatings, lacquers, hot metal strip coatings, vinyl protective coatings, adhesives, fire-resistant coatings, wood-sealer formulations, marine paints.

Biological resistance and AROCLORS

In recent tests, Monsanto AROCLORS exhibited distinct resistance to fungi and bacteria. The presence of this resistance in AROCLORS indicates that further study of these commonly used plasticizers can prove highly interesting wherever various types of organism attacks are encountered. Excellent repellency of termites and other soil mites is another AROCLOR feature.

ASK FOR AROCLOR LITERATURE

Contact any Monsanto District Sales Office, or write direct, for any of the following Technical Bulletins — No. P-115, "THE AROCLORS" . . . No. P-124, "AROCLORS as used in chlorinated rubber" . . . No. P-126, "AROCLORS as used in Pliolite S-5" . . . No. P-131, "AROCLORS as co-plasticizers for polyvinylchloride."



Sequestering action and water-softening power of Monsanto Phosphates

The sequestering action of Monsanto phosphates—inactivation of calcium and magnesium water hardness—is a significant property of both Monsanto Sodium Tripoly Phosphate (STP) and Tetra Sodium Pyrophosphate (TSPP) . . In detergent and cleaning operations, these Sodium Phosphates combine with the calcium and magnesium ions present in hard water. They form complexes with these ions — the complexes remain soluble in water, but will not react with other substances to form insoluble precipitates . . . They have the ability to regenerate or re-dissolve insoluble calcium and magnesium soaps. This property is of value where clothes containing a residue of insoluble curds are agitated in a solution of STP or TSPP. Fabrics are restored to their original clean condition.

Peptizing value of Monsanto Phosphates

An outstanding property of Monsanto TSPP is its peptizing value—that is, the ability to keep small particles of solids suspended in a water solution. This suspension action prevents the re-deposition of removed soil during the cleaning and rinsing cycle.

MONSANTO PHOSPHORIC ACID

Monsanto supplies phosphoric acid of high purity in concentrations of 75% and 85% H_3PO_4. 75% phosphoric acid is available in tank cars, stainless steel drums, barrels and carboys and meets Food Grade specifications. 85% phosphoric acid is available in stainless steel drums and carboys and meets N. F. specifications.

• • • • • • • •

MONSANTO CHEMICAL COMPANY, 1700 S. Second Street, St. Louis 4, Missouri. District Sales Offices: Birmingham, Boston, Charlotte, Chicago, Cincinnati, Cleveland, Detroit, Los Angeles, New York, Philadelphia, Portland, Ore., San Francisco, Seattle. In Canada, Monsanto Canada Limited, Montreal.

*Reg. U. S. Pat. Off.

MONSANTO
CHEMICALS AND PLASTICS

SERVING INDUSTRY . . . WHICH SERVES MANKIND

SEND INFORMATION: ☐ Plasticizers for Adhesives. ☐ Mildew-proofing vinyls. ☐ Sulfuric acid plant designs. ☐ Corrosion-preventing paper.

SEND LITERATURE: ☐ Saccharin recipe book. Technical Bulletins ☐ No. P-115, "THE AROCLORS." ☐ No. P-124, "AROCLORS as used in chlorinated rubber." ☐ No. P-126, "AROCLORS as used in Pliolite S-5." ☐ No. P-131, "AROCLORS as co-plasticizers for polyvinylchloride."

SEND SAMPLE: ☐ Ortho-Nitrochlorobenzene.

MONSANTO CHEMICAL COMPANY
1700 South Second Street, St. Louis 4, Missouri

Please send, without cost or obligation, information, literature or samples as indicated at left.

Name.....Title.....

Company.....

Street.....

City.....Zone....State.....

When inquiring check CP 2306 on handy form, pgs. 2-3

of long-term acceptability in drugs, toiletries and food products, can be supplied without difficulty from contemplated production from natural fats and oils. This will serve to comply with past resolutions of the American Drug Manufacturers Association that substitutes should not be used in drug products "unless absolutely necessary".

Use of the material has been extended into the field of fluid mechanics research, the glass industry, in the reconditioning of paper in photostating, as a decorative finish for wood or metal, and in dentifrice preparations.

Glycerine had been found to possess an exclusive property called photoviscosity. This phenomenon can be observed when the material is made to flow through a transparent pipe containing baffles or other obstructions which interrupt the flow of the smooth liquid. Without the aid of any special lighting arrangements, the streamlines or flow patterns are clearly visible. These lines persist in the liquid for 30 or 40 min after the flow has been stopped. The nature or cause of this unusual property is as yet unexplained. Best test results are obtained by observing the glycerine in the tube after it has been passed through a screen secured in the apparatus. A piece of paper folded in vertical pleats is said to be the best background for observing the phenomenon.

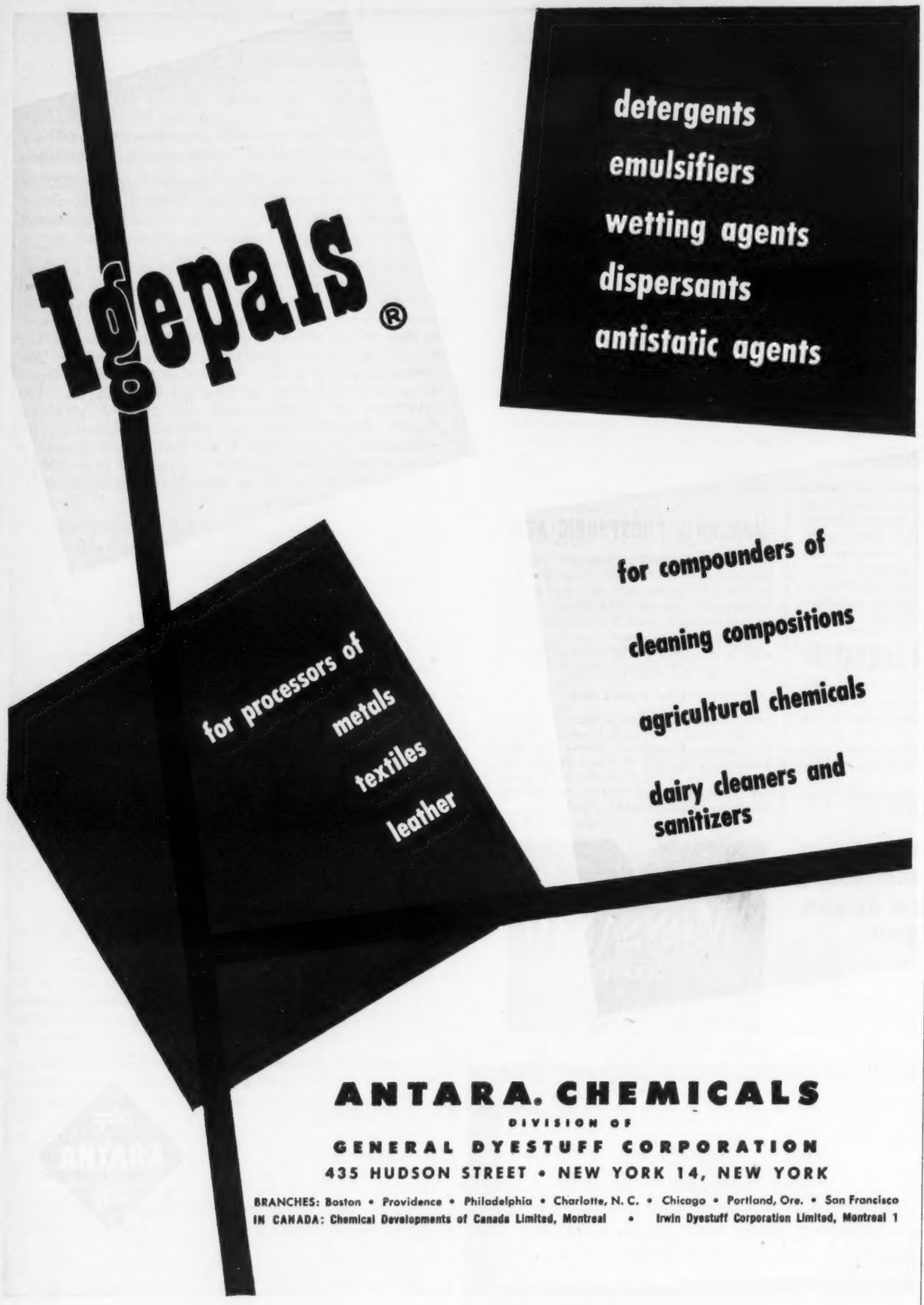
In the glass industry, glycerine has effectively solved a problem of spraying glass enamel over the smooth, opaque glass used for cosmetic and ointment jars. With previous methods the enamel would tear or break as soon as the spray hit the glass, with the result that usually more than 50% of each run had to be wiped off and sprayed over. It was found that four to eight ounces of a 13% glycerine in alcohol solution in 50 lb of enamel slip overcame the problem completely.

Another use for glycerine is in the reconditioning of paper. When documents, letters, drawings or other papers are photostated or blueprinted, the copies often contain "ghosts" — exaggerated reproduction of folds, erasures, or other flaws in the originals. A solution consisting of 35 volume per cent glycerine and 65 volume per cent ethyl alcohol has been described as an excellent means for removing all such traces. Solution is applied by brush or glass rod directly to the paper at the point of the flaw or fold. After it is blotted and dried, the paper will have regained its original overall uniform appearance, it is claimed.

A recent patent discloses a decorative finish for wood or metal which gives the effect of hammered metal without requiring the special spray equipment or subsequent applications of splatter thinners that most similar coatings do. The vehicle for the coating is a reaction product of castor oil modified glyceryl phthalate resin with the ester of maleic anhydride and rosin.

In dentifrices, glycerine's familiar use has been extended to include a new line of dental preparations which cleanse by stimulating enzymatic action in the mouth rather than by the action of soaps, detergents, and abrasives. The plaque or film which forms on teeth and which is the forerunner of tartar and dental carries consists mainly of mucin, a precipitated component of saliva. Ingredients in the new dentifrices are said to react with enzymes and saliva in such a way that this plaque readily becomes soluble, and is easily rinsed away. One of the advantages claimed for the new dentifrices is that they reach the mechanically less accessible places in and between the teeth where cleansing is most important.

(Information supplied by the Glycerine Information Service, Dept. CP, 295 Madison Ave., New York 17, N. Y.)



When inquiring check CP 2307 on handy form, pgs. 2-3

MATERIALS

Offers promise for elimination of weedy grasses under variety of conditions . . .

acts primarily through soil to disrupt normal growth and mitotic division in susceptible plants

Uses: Product is selective herbicide which is most effective on certain narrow-leaved plants. It appears to be particularly useful for elimination of grassy weeds from broad-leaved crops such as peas, beans, beets, Ladino clover, flax, and strawberries.

Description: Chemically, IPC is isopropyl carbanilate. It is generally believed that IPC and related compounds act by disrupting normal growth and mitotic division in susceptible plants. It has been shown that the root system of these plants is far more sensitive to IPC than the above ground portions. The compound gains entry into the soil where it comes in contact with the germinating grass seed, or with the roots of the seedling grass, causing the plant to die.

IPC is usually applied by means of ground spraying equipment either as a wettable powder, emulsion, or suspension. Since it is most effective when brought into direct contact with the plant roots, it is important that spray be directed primarily at the soil. Such application should then be followed by either normal rainfall or irrigation so as to bring the IPC into direct contact with the plant roots.

Compound is unaffected by dilute acids and bases, but prolonged exposure to concentrated mineral acids and bases effects hydrolysis to aniline, carbon dioxide, and isopropanol. It is believed to be relatively non-toxic to humans and non-corrosive to the skin. However, since actual long term toxicity data are not yet available, due care should be exercised in the handling of this material.

It is non-hygroscopic, has a melting point of 86°C and a bulk density of approximately 33 1/3 lb/cu ft.

(IPC is available from Monsanto Chemical Co., Dept. CP, St. Louis 4, Mo. . . . or for more information check CP 2308 on handy form, pages 2 and 3.)

Fluorescent additives to paints, glues reveal any imperfections easily with ultraviolet aid . . .

high-intensity invisible ray unit assures complete coating coverage, reduces rejects 90%

A fluorescent additive to glue, paints, and other protective coatings, when used with long-wave ultraviolet or "black" light units, can assure complete coverage of leak-proof articles and reduce rejects by as much as 90%.

Materials are of two major types: visible, brilliant daylight colors whose intensities are magnified many times under "black" light; and invisible, which although not transparent, appear white to cream in ordinary light and glow intensely under the "black" ray unit. The paints may be brushed, sprayed, or silk-screened, and have greater durability and a longer life than fluorescent materials of this type, manufacturer reports.

Lamps are equipped with 4, 15, or 40w tubes mounted either single or double in the fixtures. Overall length of the respective units are 6½" for the 4w tube, 19" for 15w tube, and 49" for 40w tube. Light from the unit is harmless to eyes or skin.

(Product of Ultra Violet Products, Inc., Dept. CP, 145 Pasadena Ave., South Pasadena, Calif.)

Only material preventing neoprene from scorching in bin storage—report . . .

resin also raises physical values, aids processing of rubber stocks

Uses: An oil-proof hardening material for natural and synthetic rubber compounds.

Features: Maker reports that this resin is the only material he knows of that will prevent neoprene from scorching or "setting up" in bin storage.

In addition, the resin raises and sustains modulus, increases hardness, extends flex life, greatly increases tear resistance, plasticizes, and in general simplifies processing.

Description: Sublac Resin PX-5 is a white, finely powdered processing resin especially advantageous in stocks highly loaded with clay, whiting, or silene. It has no specific melting point but combines readily with synthetic as well as natural rubber stocks at all processing temperatures. It may be added with the filler or directly to the rubber. The mixture handles well at roll temperatures of 160°F (front) and 125°F (back).

PX-5 is reported to eliminate need for zinc oxide and accelerators in using basic fillers.

(Product of The Polymel Corporation, Dept. CP, 1800 Bayard Street, Baltimore 30, Md. . . . or for more information check CP 2309 on handy form, pages 2 and 3.)

Commercial quantities of nonyl phenol

Uses: In manufacture of wetting and emulsifying agents, and of oil additives. Also suggested for use as an intermediate in synthetic resins, rubber chemicals, dyestuffs, and pharmaceuticals.

Description: Nonyl phenol is now being produced in commercial quantities by Rohm & Haas Co. Since it is a liquid at room temperatures, it offers handling advantages over solid alkyl phenols, which must be handled in dry or molten form.

(Rohm & Haas Co., Dept. CP, Washington Square, Philadelphia, Pa. . . . or for more information check CP 2310 on handy form, pages 2 and 3.)

For more information on product at right, specify CP 2311 . . . see information request blank between pages 2 and 3.

facts you may want to know about—

Magnesium Trisilicate

Foremost American Producer

Mallinckrodt, one of the first American producers of pharmaceutical grades of magnesium trisilicate, began manufacturing this valuable antacid in 1937 and is today among the foremost domestic producers.

Dependably Uniform

Of special value to pharmaceutical manufacturers is the high degree of lot-to-lot uniformity of Mallinckrodt magnesium trisilicate, not only in chemical composition but also in moisture content, particle size distribution, and bulk. Mallinckrodt magnesium trisilicate fully meets U.S.P. requirements.

Forms Available

To fit both tableting and suspension needs Mallinckrodt magnesium trisilicate is supplied in the following forms:

Magnesium Trisilicate U.S.P. Powder
Magnesium Trisilicate U.S.P. Bulky
Magnesium Trisilicate U.S.P. Super Bulky

Important Properties

Important Properties—Typical Values

	Powder	Bulky	Super Bulky
Bulk—Approx. fl. oz./lb. . . .	45	75	130
Approx. Particle Size Distribution*			
less than 5 microns	15%	50%	65%
5-10 microns	10%	30%	15%
10-20 microns	35%	10%	15%
20-40 microns	40%	10%	5%
*Determined by sedimentation methods.			
Adsorptive power— mg. methylene blue/gram . . .	not less than 100	not less than 200	about 150
Acid consuming capacity— cc. N/10 HCl/gram	140-160	140-160	140-160

Companion Products

For alkaline mixtures containing magnesium trisilicate, Mallinckrodt also supplies top-quality companion products such as Magnesium Carbonate U.S.P., Calcium Carbonate U.S.P. and Bismuth Subcarbonate U.S.P.

Samples and prices will be supplied on request. For technical information write for Magnesium Trisilicate Data Unit X-212.

MALLINCKRODT CHEMICAL WORKS
Mallinckrodt St., St. Louis 7, Mo. • 72 Gold St., New York 8, N. Y.
Chicago • Cincinnati • Cleveland • Los Angeles • Montreal • Philadelphia • San Francisco

ORGANIC INTERMEDIATES • INORGANIC CHEMICALS • CHEMICALS FOR ELECTRONIC USES • METALLIC SOAPS • ANALYTICAL REAGENTS • PHOTOGRAPHIC CHEMICALS •

Mallinckrodt®

MANUFACTURERS OF FINE CHEMICALS FOR INDUSTRY • SINCE 1867 •

quick! get

ANTIFOAM A

Foam wastes time; takes space; invites fire.

Kill foam with Dow Corning Antifoam A, the most efficient and versatile defoamer on the market. This silicone defoamer is also most economical to use because only trace quantities are required to quell many of even the most violent and persistent foamers.

Tar and asphalt, for example, are effectively defoamed during processing as well as during application by concentrations of Antifoam A as low as 4 parts in 10 million.

Ten ounces of Antifoam A added to a 40,000 gallon batch of crystallizing sodium bromide prevented foaming in that batch and in the next 21 batches as well. Here the effective concentration works out to about 1 part in 10 million.

If cost, contamination, or full use of process equipment are prime considerations in your operations, try Antifoam A. Practically odorless, tasteless and non-toxic, Antifoam A is safe, fast and by far the most economical and versatile defoaming agent on the market.

DOW CORNING SILICONES

See for Yourself

Send for trial sample of Antifoam A

Dow Corning Corporation
Dept. BB-17, Midland, Michigan

Name_____
Company_____
Street_____
City_____ Zone ____ State _____

DOW CORNING CORPORATION
Midland, Michigan

When inquiring check CP 2312 on handy form, pgs. 2-3

Here's a Helpful Selector for Picking Substantive Softener for Textile Needs

Four products reported to answer problems stemming from great variety of properties governing selection, use of conventional agents

USES	FEATURES	DESCRIPTION
AMPITOL ZB — to produce a permanently soft hand on acetate and viscose rayons and nylon. To prevent chafe marks and similar processing damage to rayons and nylon.	Resists dry cleaning and washing. Has excellent gas inhibiting properties. Readily soluble in hot water. Compatible with starch, dextrines, gums, and similar substances. Not compatible with anionic agents such as soap, sulfated oil, etc. Not to be used in strong alkaline solutions. The pH of a 0.1% solution at 25°C is 4.5.	A cationic softener, substantive to cotton, acetate, viscose rayons and nylon. Produces an exceptional degree of softness.
AMPITOL KZ3H — to produce an unusual soft hand upon cotton, acetate, viscose rayons, and nylon where maximum whiteness or resistance to light fading of the colors is important. Apply as an after-treatment of the processed goods without need for rinsing goods free of anionic agents. Apply directly in the dyeing operation and with other substances which might cause trouble with conventional softening agents.	Resists dry cleaning and washing. Soluble in neutral, acid, and alkaline solutions; unaffected by hard water. When used on the acid side, light fastness properties are slightly affected, but all other results are completely satisfactory. Compatible with anionic and cationic agents under normal processing conditions. Compatible with starch, dextrines, gums, and similar substances. Readily dissolved in water. The pH of a 0.1% solution at 25°C is 10.5.	Substantive softener combines the advantages of both AMPITOL A and KZA, and produces a high degree of softness upon cotton, acetate, viscose rayons and nylon.
AMPITOL KZA — to produce an unusual soft hand upon acetate, viscose rayons, and nylon by: 1) After-treatment of the processed goods, without need for rinsing goods free of anionic agents. 2) Direct application in dyeing operations and with other substances which might cause trouble with conventional substantive softening agents. Capable of producing a variety of effects in processes which heretofore had to exclude the use of a substantive softener.	Resists dry cleaning and washing. Soluble in neutral, acid, and alkaline solutions; unaffected by hard water. Compatible with resin mixes and with copper after-treatments. Compatible with all cationic and anionic agents, under unusual processing conditions. The pH of a 0.1% solution at 25°C is 7.7.	Completely substantive to cotton, acetate, viscose rayons, and nylon. Under normal processing conditions it does not precipitate with anionic or cationic substances. Can be used with acids, alkalis, resins, and copper salts.
AMPITOL A — for permanent softening of cotton, acetate, viscose rayons, and nylon where maximum whiteness or resistance to light fading of the colors is required. To prevent chafe marks and similar processing damage to acetate and viscose rayons and nylon.	Resists dry cleaning and washing. Soluble in neutral and alkaline solutions. Compatible with anionic agents under normal processing conditions. Compatible with starch, dextrines, gums, and similar substances. Not for use in strong acid baths. When used on the acid side, light fastness properties are slightly affected, but all other results are completely satisfactory. The pH of a 0.1% solution at 25°C is 10.1.	Anionic softener substantive to cotton, acetate, viscose rayons and nylon. Does not affect the light fastness of direct colors; does not yellow whites. Produces a high degree of softness.

A research program directed toward the development of new substantive softeners and simplification of softener selection has recently been concluded by the Dexter Chemical Corporation, N. Y.

Four products are reported to answer the textile finisher's numerous problems involved with the use of conventional substantive softening agents. These problems have, until now, stemmed from the tremendous variety of properties which govern agent selection and application.

Among the more significant properties controling the selection and use of substantive softeners are effect on hand, effect on lightfastness of colors, yellowing of whites, resistance to washing and dry cleaning, anti-static effect, inhibiting of gas fading and compatibility of the softener with acid, alkali, anionics, cations, sulfated oils, soaps, hard water, resins, and copper salts. The adjacent table is presented as a selector.

(Ampitol substantive softeners are products of the Dexter Chemical Corporation, Dept. CP, Boulevard PO Box 1, New York 59, N. Y. . . . or for more information check CP 2313 on handy form, pages 2 and 3.)

Act as extenders and softeners in the processing of rubber cmpd's . . .

compatibility of vulcanized vegetable oils assures rapid incorporation either by mill or banbury

Uses: Compounds are employed with natural and synthetic rubber to impart some desired property to the finished product, to aid in the processing of the compound, and to act as an extender.

Majority are most widely used in molded products, proofed goods, soft rubber rolls, erasers, and in all types of extruded goods. Extender 600 of the below-mentioned Brown series is a specially modified vegetable oil copolymer for use as a plasticizer for both acrylonitrile and styrene-butadiene copolymers, as well as for natural and reclaimed rubber.

Features: Compatibility assures rapid incorporation either by mill or banbury.

Description: Harwick vulcanized vegetable oils or rubber substitutes are available in a Brown and White series of compounds. Former, consisting of 25 products, can be used in almost all stocks except pastel colors and whites. Latter series includes 15 different compounds and is of use in very light colored and white compounds.

It is reported that in either natural or synthetic these compounds produce a soft, smooth feel in the finished article. In soft, heavily loaded GR-S stocks, they impart good snap, flexibility and rapid recovery, which makes the synthetic rubbers feel much more like natural rubber than they would otherwise.

The rubber substitutes have a mild softening effect in uncured stocks and are frequently used as aids to extrusion, because they keep stock flowing smoothly from the extruder and also help to maintain an even gage. It is stated that they can replace part of the rubber hydrocarbon in a compound and thus help to reduce cost under normal conditions.

They have very little tensile strength in themselves although up to 10% can be added to the rubber without much change in cured physical properties. Much larger quantities are used where very high tensile strength is not of primary importance in the finished product.

They are available in cake or granular form. In the case of ground substitutes, the cake is run through a roller mill for the coarse grind — or followed by running through a high speed rotary knife mill for the fine grind.

(Manufactured by Harwick Standard Chemical Co., Dept. CP, 901 Broad St., Bank Bldg., Trenton 8, N. J. . . . or for more information check CP 2314 on handy form, pages 2 and 3.)

Services production problems in rubber and plastics

Five-page bulletin announces raw materials and processing methods designed to solve technical and production problems involving rubber and plastics. Raw materials used are synthetic and natural latex and vinyl plastic resins. Materials are briefly described in relation to concentration, preparation, viscosity, etc. Bulletin lists seven paragraphs of practical applications of plastic materials. Major uses are in coating equipment, apparatus, and manufactured products.

"Latex and Plastic Compounds and Products" is issued by Plastex Products Company, Dept. CP, 312 Dobbs St., Marietta, Ga. When inquiring specify CP 2315 on handy form, pages 2 and 3.

now available in pilot-plant quantities

Properties of a typical sample of Jefferson's Ethylene Carbonate are:

Melting point, °C	35-36
Refractive index @ 40°C	1.4190
Flash Point (open cup), °F	320
Appearance	
liquid	clear, water-white
solid	white, crystalline
Boiling point, (740 mm), °C	243-244

Suggested Applications:

high boiling solvent for polyacrylonitrile, lignin, and certain other polymeric materials

intermediate for preparation of pharmaceuticals, agricultural chemicals, fungicides, plasticizers, and other products

convenient hydroxyethylating agent.

You may obtain technical information and experimental samples for research and development by sending the coupon or by writing to our Market Development Division, Dept. D.

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Essential Chemicals From Hydrocarbon Sources: Ethylene Oxide • Ethylene Glycol • Ethylene Dichloride
Diethylene Glycol • Monoethanolamine • Diethanolamine • Triethanolamine

Jefferson Chemical Company, Inc.
Market Development Division, Dept. D
260 Madison Avenue, New York 16, N. Y.
Gentlemen:
☐ Please send technical data on ethylene carbonate.
☐ Please send experimental sample.

Name_____ Title_____
Company_____
Address_____
City_____

When inquiring check CP 2316 on handy form, pgs. 2-3

AMMUNITION

for an IDEA MAN

Photomicrograph of Nalcite HCR

Nalco

ION EXCHANGE MATERIALS

NALCO Ion Exchange Materials are excellent ammunition for an idea man looking for process shortcuts. Metal and acid removal or recovery, purification, softening or demineralization processes can make full use of the modern techniques possible with these stable, uniform products . . .

Nalcite HCR — CATION EXCHANGE RESIN
• Styrene type, spherical form • Capacities of 30,000 grains per cubic foot, and higher • Full operating efficiency at temperatures to 250°F. • Either salt or acid regeneration • Efficient performance over the entire pH range

Nalcite SAR — STRONGLY BASIC ANION EXCHANGE RESIN
• Removes all acids, including carbonic and silicic • Spherical particles, 99% retained on 20 to 40 mesh screens • Insoluble in water, aromatic and aliphatic hydrocarbons, non-oxidizing acids and bases • pH operating range from 2.0 to 10.0

Nalcite WBR — WEAKLY BASIC ANION EXCHANGE RESIN
• High-capacity removal of stronger acids • Polyamine-polystyrene resin in spherical form • High chemical stability

Write for full technical data on Nalcite Resins

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Canadian inquiries should be addressed to Alchem Limited, Burlington, Ontario

A Nalco® PRODUCT . . . *When you use Nalcite resins, you take advantage of Nalco's long and broad experience in water and process technology.*

When inquiring check CP 2317 on handy form, pgs. 2-3

MATERIALS

Polyvinyl films on paper reported non-blocking . . .

also tough, glossy; scuff, water, and grease resistant

Uses: Polyvinyl acetate copolymer solution developed especially for the paper-coating industry.

Also recommended for adhesives, inks, lacquers and other protective coatings, saturants, and sizings.

Features: Reported to deposit films with non-blocking characteristics. In addition, films are tough, glossy, scuff resistant, water resistant, grease resistant, and heat sealable.

Description: Polyco 408 can be reduced to a solids content of 45% with ethyl alcohol without causing precipitation of the copolymer. It is soluble in all proportions with ethyl acetate and acetone.

It does not require fusion for good adhesion or gloss. Heating for 1 or 2 minutes improves adhesion on less porous surfaces, however.

As an added note to non-blocking characteristics, pressure tests of 1 pound per square inch at 120°F and at 78% relative humidity showed no evidence of face-to-face-blocking.

(Product of the American Polymer Corporation, Dept. CP, Peabody, Mass. . . . or for more information check CP 2318 on handy form, pages 2 and 3.)

Phenolic used for all general-purpose molding . . .

good flow, low flash, and fast cure are reported

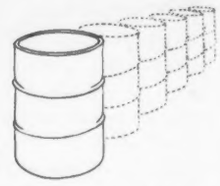
Uses: General-purpose phenolic molding compound.

Features: Shows little tendency to flash at high transfer pressures, thus conserving material and reducing finishing costs. Good flow characteristics afford reduction of transfer and clamping pressures. Reported to possess same fast cure as conventional phenolics.

Rigidity of cured pieces is advantageous in facilitating mold release and minimizing warpage on ejection.

Description: Resinox GP-1000 is currently available in bags and in drums. Good flow is said to yield strain-free parts of high uniformity.

(Product of Monsanto Chemical Company, Plastics Division, Dept. CP, Springfield, Mass. . . . or for more information check CP 2319 on handy form, pages 2 and 3.)



Better Service from steel drums through chemical resistant linings

Drums will have to work harder during the shortage. Put *your* steel containers into fit condition for extra service by asking your supplier to use a Unichrome Drum Lining made to stand repeated trips in contact with strong chemicals.

By using these linings, many newly developed chemicals, as well as various acids, alkalies, alcohols, petroleum derivatives, wetting agents, foodstuffs, cleaners, salt and other solutions can be securely shipped without damage to lining, corrosion of container and contamination of contents. Write us for information on linings available and the tough chemicals each can withstand.

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When inquiring check CP 2320 on handy form, pgs. 2-3

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4 for manufacturers of **STEROID HORMONES and VITAMINS**

1. **NBA (N-Bromoacetamide)** ***Stable!*** **$CH_3CONHBr$ (57.9 ± 0.3% Min. Act. Br_2 Guaranteed)**
2. **NBS (N-Bromosuccinimide)** ***Stable!*** **(44.5% Min. Act. Br_2 Guaranteed)** ***Ask*** **for our Succinimide Recovery Program**
3. **Girard's "P" & "T" Reagents — (C_5H_5N+) $(Cl-)$ $(CH_2CONHNH_2$** ***Stable!*** **$(CH_3)_3$ $N+$ $(Cl-)$ $CH_2CONHNH_2$** ***Hygroscopic!***
4. **Grignard Reagents (RMgX) — And** ***Custom Manufacturing*** **via the Anhydrous, Hazardous, Useful Grignard Reaction.**

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PRODUCERS OF FINE ORGANIC CHEMICALS

When inquiring check CP 2321 on handy form, pgs. 2-3

Effect of melamine resin on chemical tests of paper

Melamine-formaldehyde resin is one of the many synthetic materials used in the manufacture of plastic products. Adaption of this resin to paper technology has resulted in the improvement of many important properties of paper including dimensional stability, freedom from linting, reduced curl, and the development of high wet-strength without great reduction in absorbency.

With the increasing use of melamine resin in paper and paper products has come the need for data on the effects of the presence of the resin on chemical tests applied to paper in order that the results of such tests may be correctly interpreted. Accordingly, a study of some of the widely used chemical tests of paper was undertaken at the National Bureau of Standards by W. K. Wilson, J. L. Harvey, and A. A. Padgett. The work included the determinations of alpha-cellulose, copper number, rosin content, pH, and cuprammonium disperse viscosity.

It was found that the addition of melamine resin in the manufacture of a paper usually increases the analytical alpha-cellulose value of the paper. The alpha-cellulose value, which is an indication of cellulose quality and of a paper's resistance to deterioration, is analytically the fraction of the total cellulose that is insoluble in sodium hydroxide under standard test conditions.

The determination of rosin, which includes both natural resins and any soaps added to impart resistance to water penetration, is unaffected by the presence of melamine resin in paper. The copper number, on the other hand, is reduced by melamine resin; this represents an improvement, since high copper numbers are indicative of low-quality cellulose.

The NBS investigation also revealed that melamine resin undergoes an alkaline hydrolysis in hot-water solution. Papermaker's alum (aluminum sulfate), used extensively to precipitate rosin soaps and to adjust pH in the manufacture of paper, is known to undergo an acid hydrolysis in hot water solution. Since the pH of paper — another indication of the stability or permanence of paper — is often measured on the hot water extract of the paper, it is apparent that this value will depend on the relative amounts of alum and melamine resin present.

The cuprammonium disperse viscosity of cellulose is related to the length of the cellulose chains (molecules) and this is, in turn, related to the quality of the cellulose. Measurement of viscosity of papers is made on a solution of the paper in a suitable solvent, in this case cuprammonium hydroxide. In measuring the cuprammonium viscosity of papers with and without malamine resin, it was found that the resin renders high quality papers only partially soluble in the reagent at 0.5% concentration. For this reason viscosity measurements lose their meaning.

In addition to the chemical tests mentioned, the effect of melamine resin on the heat stability test, used to compare the relative stabilities of papers to natural aging, was examined. Results indicated that melamine resins tend to stabilize papers, as measured by the changes occurring in alpha-cellulose and copper number on accelerated aging.

In summary, the presence of melamine resin in a paper, in addition to imparting special properties, appears to produce a slight improvement in the quality of cellulose and in the stability of the paper. Whether such improvements are related to the true permanence of a paper — its resistance to natural aging — is yet to be determined.

(Information courtesy of National Bureau of Standards, U.S. Department of Commerce, Washington 25, D.C.)

2 NEW

Victor research chemicals now available

Derived from the Benzene Phosphorus Chlorides, Victor Benzene Phosphonic Acid and Benzene Phosphinic Acid are offered for your evaluation. The interesting properties of these two new compounds indicate usefulness in several commercial applications. Upon investigation, you may find them of assistance in helping to make new compounds you are seeking. Write for your experimental samples today, on your company letterhead. Our technical staff will be pleased to work with you.

BENZENE PHOSPHONIC ACID

$(C_6H_5PO(OH)_2)$

M. W. 158 Sp. G. 1.475
M. p. 158°C Colorless crystals
Strong dibasic acid
Soluble in water, alcohol, ether
Insoluble in benzene
Stable in air
Forms metallic salts
Solubility in water at 25.5°C:
40.3 gm/100 gm water

Suggested uses are for non-food applications, such as:

Solid acid, intermediate for forming metallic salts used as anti-fouling agents in paints, catalyst for urea formaldehyde and related resins.

BENZENE PHOSPHINIC ACID

$(C_6H_5PHO(OH))$

M. W. 142 M.p. 82-84°C.
Strong monobasic acid Colorless crystals
Soluble in water and alcohol
Slightly soluble in ether
Stable in air
Slight characteristic phosphine odor
Forms metallic salts
Oxidizes to the phosphonic acid with ordinary oxidizing agents such as hydrogen peroxide and nitric acid.
Solubility in water at 25.5°C:
7.7 gm/100 gm water
Suggested uses are for non-food applications, such as:
General Anti oxidant
To improve film properties of cured polysiloxane resins
Accelerator for organic peroxide catalysts

Dependable Name in Chemicals for 54 Years

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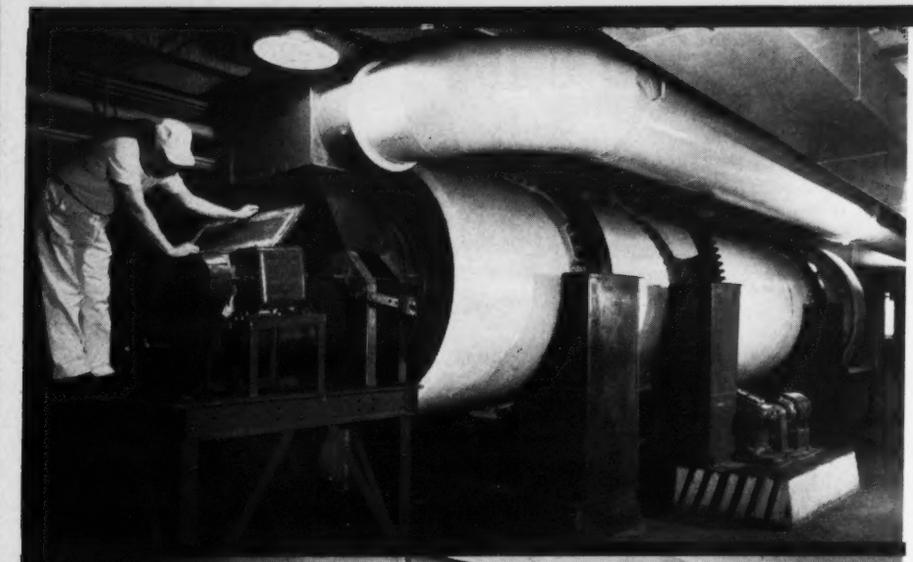
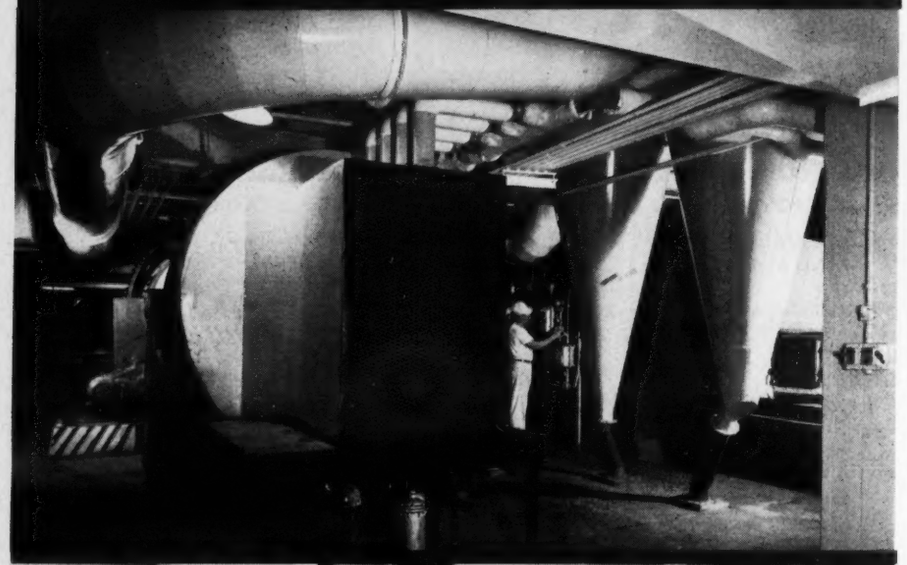
When inquiring check CP 2322 on handy form, pgs. 2-3

Wet Liver Residue—Low Revenue; Dried Some—$123 per Ton

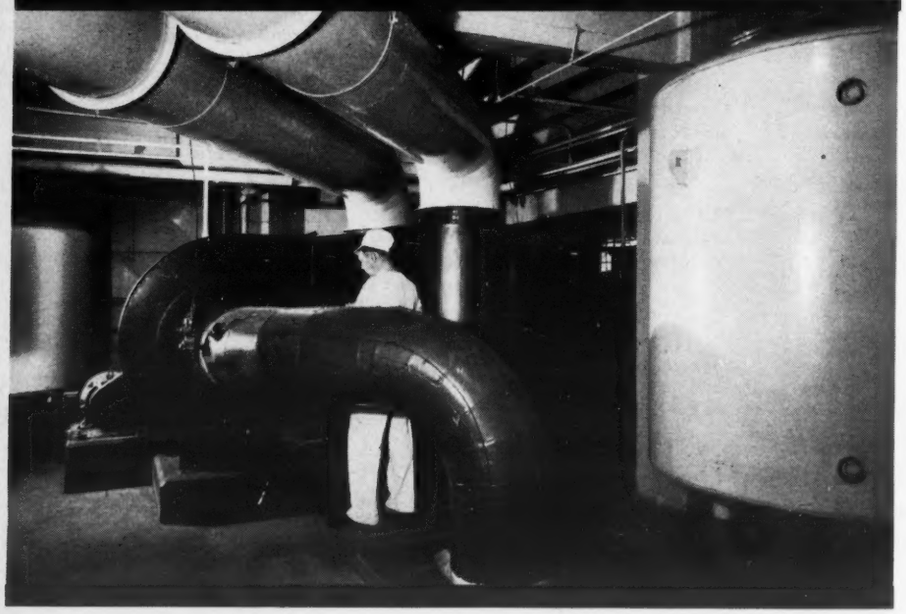
Eli Lilly profits on high-protein by-product after drying to 8% moisture in rotary dryers; step eliminates the stench of organic decomposition



Feed end of rotary dryer for liver residue. Wet residue is fed into dryer by ribbon screw conveyor being inspected here. Direct contact with counter-current flow of hot air does the drying from 75 to 8% moisture. Duct leaving dryer is carrying air, vapor, and fines to exhaust fan and cyclone collectors



Room air is heated as it is drawn over finned steam coils (foreground) at material exit of dryer. At right are bottom cones of two dust collectors that remove fines carried out of dryer by the drying air



Outlet air duct of dryer connects into exhaust fan which discharges through dust collectors

RESIDUE left after processing liver for medicinal constituents at Eli Lilly and Company in Indianapolis was put into barrels and sold to a meat packing house for addition to the protein portion of its rendered by-products. This residue, containing about 75% moisture, did not bring in much revenue in the wet form because further processing by the packing house was required before it could be sold.

Lilly engineers became interested in drying the residue so it would have higher value (assuming, of course, that the drying costs could be kept low enough). Then too, they saw the opportunity of eliminating the stench that arose from the wet liver residue as it started to decompose while standing.

First step was to make some test drying runs on the residue, and this was done in the pilot dryer The C. O. Bartlett & Snow Company maintains for this purpose. (See CHEMICAL PROCESSING, April 1952, page 14.) Results looked promising, so two production rotary dryers were installed. Under the existing production set-up, solid liver residue is discharged from filter into a chute which is connected by conveyor to either of two counter-current, hot air, rotary dryers located on the floor below. Each dryer handles 1000 lb/hr of wet feed, and reduces the moisture content from 75 to about 8%. Hot air temperature is 310°F. Dried material leaves through a breeching at the discharge end. Bottom of the breeching connects to a bagging hopper. Dried product is sold for use in protein animal feeds.

Dryers are Bartlett-Snow Style J. They have 66″ OD cylinder, 25′ long, arranged at slope of ⅛″ per foot, and designed to revolve at 2 rpm. The cylinder interior is fitted with spiral flights and with longitudinal parallel lifting flights which pick the material up and cascade it in thin, even sheets for quicker drying.

The wet liver residue is fed into the dryer by ribbon screw conveyor which feeds one foot inside of dryer feed ring onto helical feed flights. Experience indicates that the material tends to build up and clog in a chute.

Air is heated by passing over finned steam coils. It is drawn through the dryer by exhaust fan that discharges through cyclone dust collectors. These collectors remove the fines that are picked up in the dryer by the air.

The dried liver residue is selling for about $123 per ton, based on an average of 65% protein. Cost of utilities for

the drying operation is about $7 per ton (this does not include carrying charges for plant and equipment). The equipment requires practically no personnel for operation, only for bagging the product. And the bagging can be performed by operators mainly engaged in processing the original liver for its medicinal constituents. It appears obvious that the decision to dry the liver residue was a good one.

(Dryers were made by The C. O. Bartlett & Snow Company, Dept. CP, 6200 Harvard Ave., Cleveland 5, Ohio . . . or for more information check CP 2323 on handy form, pages 2 and 3.)

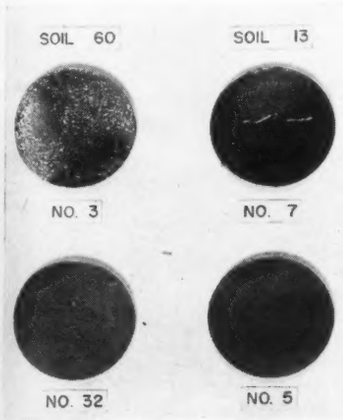
Studies of cathodic protection for underground steel establish values . . .

effects of protection, optimum potentials, other data gleaned from sixty-day test runs

Recent study by National Bureau of Standards' corrosion laboratory centered around laboratory determination of the optimum potential to be maintained for effective protection. By eliminating uncertainties inherent in field measurements, NBS was able to determine an optimum protective potential with a firm basis. Value arrived at was confirmed by weight-loss measurements on electrodes maintained at selected potentials in five corrosive soils.

Potential to be used was arrived at by an economic balance. One factor, of course, is adequate voltage to stop corrosion. Of course, greater currents must be used to maintain higher voltages — thus the other factor is the cost of producing higher voltages. On this basis –0.77 volts, based on a saturated calomel electrode, proved to be the optimum value. This is the same as the accepted –0.85 volts based on a copper-copper sulfate electrode. Air-free soils used in the test ranged from 2.9 to 9.6 in pH.

To confirm experimentally the effectiveness of a –0.77 volt protective potential, weighed steel electrodes were exposed to five soils in specially designed corrosion cells. After two days without protective current, the electrodes were maintained at –0.77 volt for sixty days. By making potential measurements with an electronic interrupter in conjunction with a potentiometric measuring circuit, all IR drop external to the boundary of the corrosion circuit was eliminated.



Upper specimens received no protection; lower specimens were maintained at —0.77 volt during sixty-day test

Weight lost during the test by electrodes maintained at –0.77 volt was negligible compared to weight losses of control electrodes that received no current. Electrodes allowed to deviate for relatively short periods to potentials less negative than –0.77 volt lost appreciable weight, but electrodes maintained at more negative potentials (–1.0 volt) showed no further reduction in weight loss.

(Condensed from Technical Report 1618 of the National Bureau of Standards, U.S. Department of Commerce, Washington 25, D.C.)

HERE'S PROOF...

that LINK-BELT's Fluid Drive with constant

CUSHION ACTION

cuts machinery wear and tear

Cutaway shows simple, rugged construction of Link-Belt Fluid Drive.

Now you can use smaller motors and power transmission equipment on your toughest drive problems. What's more, both motors and driven machines will last longer with Link-Belt Fluid Drives.

That's because constant CUSHION ACTION provides shock and overload protection . . . and at the same time eliminates high starting torque requirements and high starting currents.

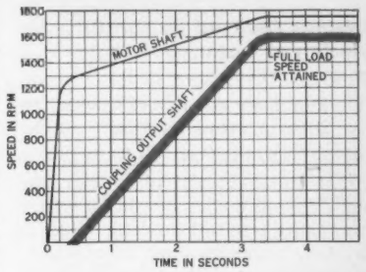
Look at the three sets of curves shown here. See for yourself how constant CUSHION ACTION is the money-saving answer for loads of the high inertia, repetitive shock or high starting torque type.

For complete information, write for Book 2485. It shows how you can put five types of Link-Belt Fluid Drives to work in your plant: Electrofluid Drive, Electrofluid Gearmotor, Fluid Drive, Fluid Gear Drive and Fluid Coupling Drive. 12,653

LINK-BELT

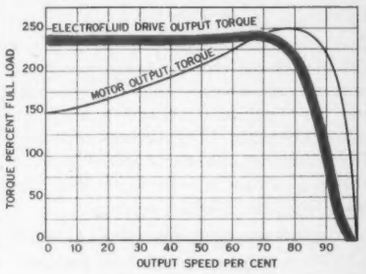
FLUID DRIVES

Smooth acceleration - -



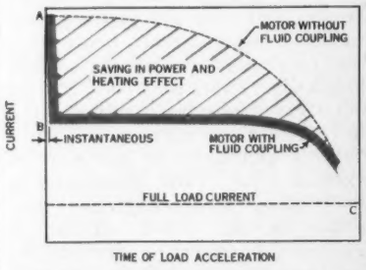
Typical motor and coupling acceleration curves for a high-inertia load show how CUSHION ACTION smoothly and gradually accelerates the load, saving wear and tear on vital equipment.

No overpowering - -



Compare the output torque of a motor with and without the fluid coupling. Because motor accelerates free of load, it reaches maximum pull-out torque that might otherwise require a special type of oversize motor.

Low starting current - -



As these current consumption curves show, with the fluid coupling, motor starting current drops instantaneously to less than half the starting current required by a motor without fluid coupling. Difference represents power savings, reduced heating.

LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa). Offices, Factory Branch Stores and Distributors in Principal Cities.

When inquiring check CP 2324 on handy form, pgs. 2-3

Savings realized by careful placing of water coolers in work areas . . .

minimum number of coolers results in man-hours lost

Proper placement of water coolers in offices and industrial plants can save many payroll dollars by cutting wasted man-hours resulting in long walks to drinking water facilities, according to an extensive study by General Electric Company.

The study also showed that in many cases two small-capacity water coolers cost far less than one large cooler serving many workers.

As a result of the survey, the company devised a five-step method of analyzing the drinking water requirements of any work center and put this information in booklet form.

Booklet contains sample floor plans for proper placement of water coolers, and an easy-to-use table for computing the payroll savings gained by using the plan. The savings resulting from additional water coolers is often realized within a year after their installation, the booklet reports.

(Information supplied by General Electric Company, Dept. CP, Air Conditioning Division, Bloomfield, N. J.)

Controllable as a vacuum tube, gas-filled diode handles sizeable currents . . .

the plasmatron may soon solve many problems

Conventional vacuum tubes are acknowledged as excellent control devices, but they are inefficient in handling large currents, hence have not been used in several control problems. Thyratrons and several other gas-filled tubes have been used to control heavy currents, but without the simplicity or precision of vacuum tubes. The plasmatron is built along a different line than either of the above classes. It promises, however, to combine the best properties of each in sort of a functional hybrid.

Inside the plasmatron is a large cup-shaped anode, a main cathode, and an auxiliary cathode. Envelope is filled with helium gas at about one millimeter pressure. In operation the gas is ionized producing a region of neutral charge and high current-carrying capabilities: the plasma. This ionization is produced by a current flow from the auxiliary cathode which, in turn, is controlled by an external electronic circuit. Thus current capacity is controlled by the auxiliary cathode; it can be con-

Why has the World's Leading Manufacturer of Pumps taken the "Pump" out of its name?

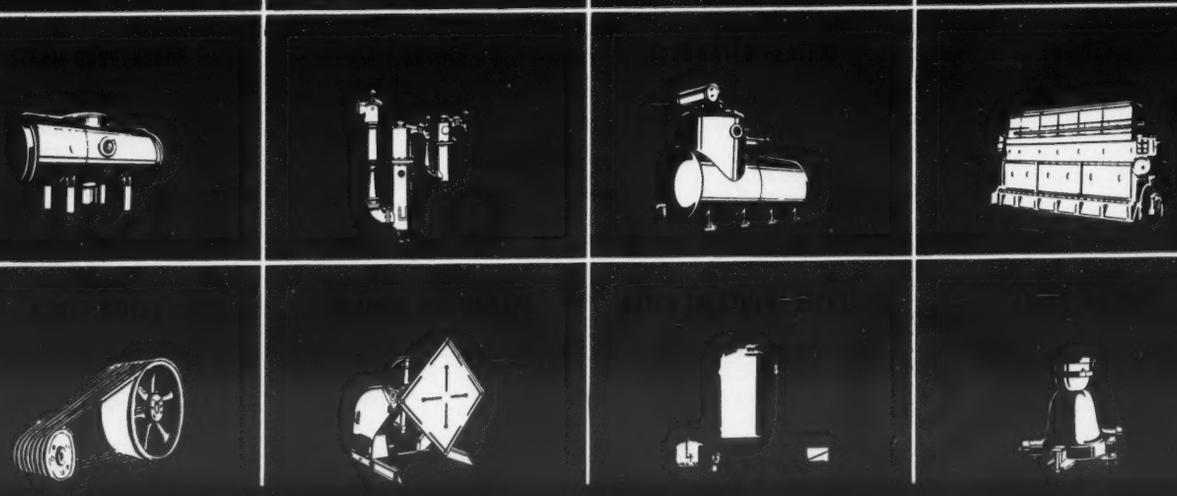
For 111 years "Worthington" has meant *pumps* to industry everywhere.

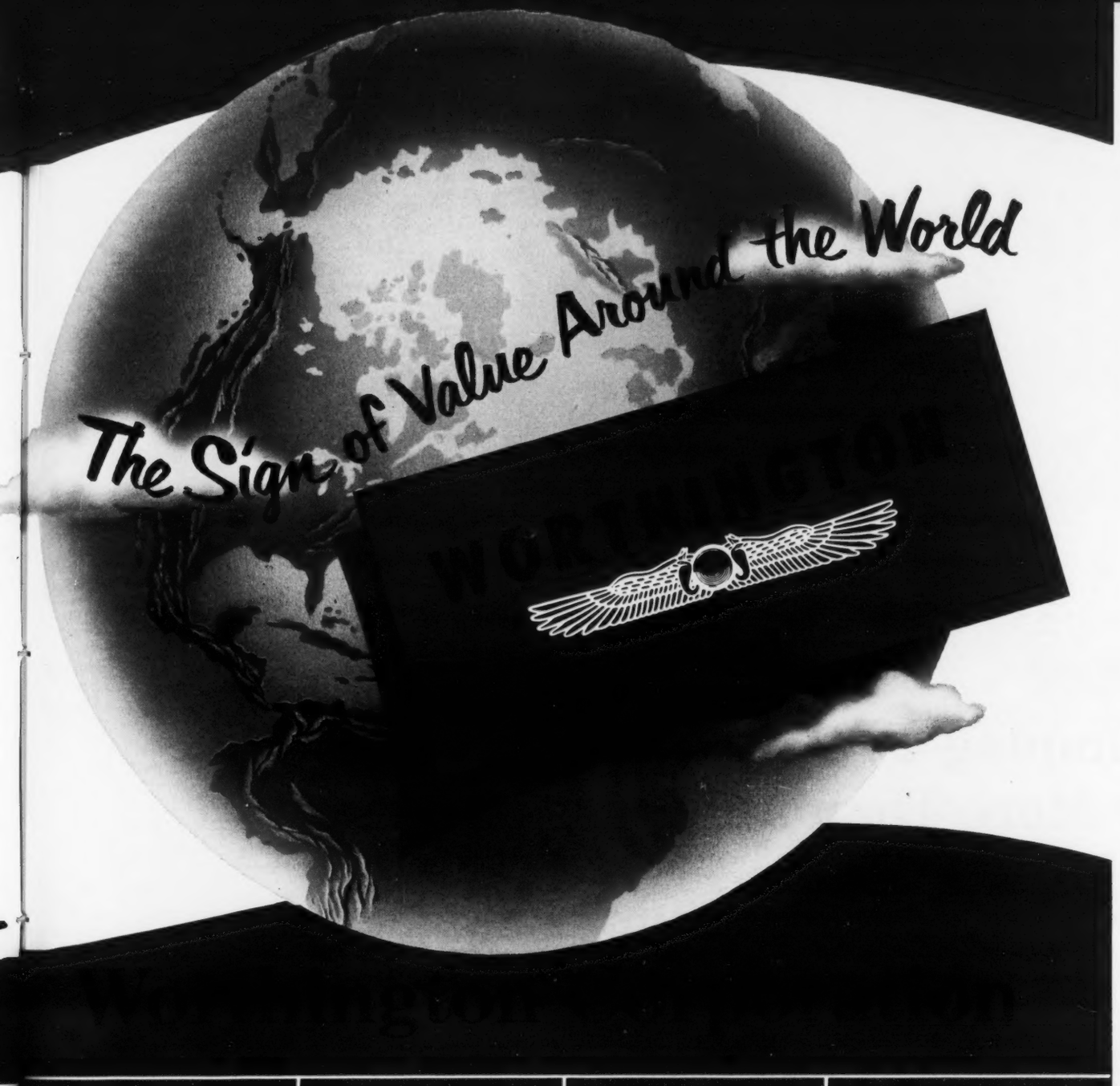
During this period, Worthington has developed a position of leadership in many related fields. Fourteen major product lines including pumps are manufactured in 21 plants throughout the world.

To those we serve, Worthington is *more than pumps*. That's why the world's leading manufacturer of pumps has changed its name from

WORTHINGTON PUMP AND MACHINERY CORPORATION

2.2





trolled by means of vacuum tube. Two limitations have shown up at this date — neither is serious in many types of service. First, control of the tube can only be maintained when the supply voltage is 24 volts or less. More than 24 volts across the anode-main cathode circuit causes complete break-down of the helium into ions, and uncontrolled arcing results. Second, frequency response is limited to 10,000 cps and under because of the time which is needed for deionization.

Still in the development stage, small units have been built to handle almost one ampere. No hitch is foreseen in building bigger ones. Current amplification of about 90-to-1 and lineality of output makes the plasmatron look like a natural for motor control, pulse circuits, oscillators, and other control equipment. At this stage, however, all work on the plasmatron is under government contract.

(Development work is in progress at RCA Laboratories Div., Radio Corporation of America, Dept. CP, Princeton, New Jersey.)

No-rust, flexible plastic pipe resists chemical action of natural gas . . .

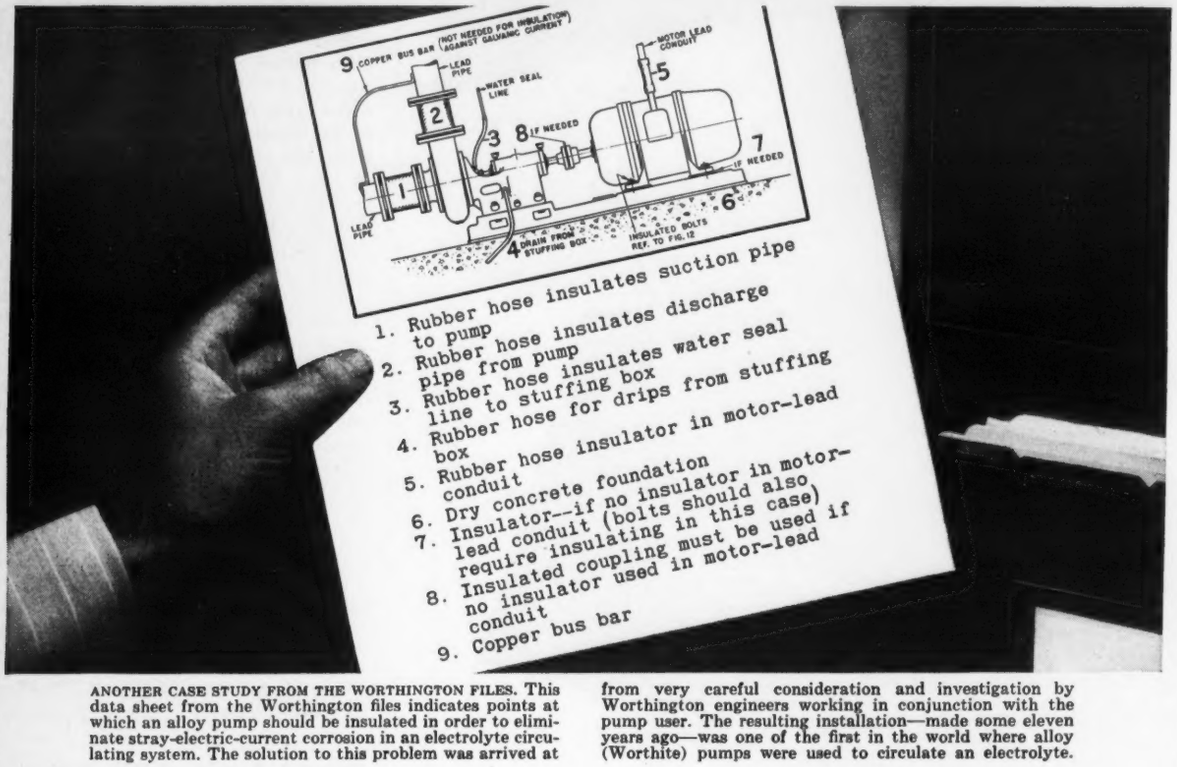
flexibility of piping permits easy installation

Long, leak-proof service life despite exposure to corrosive soils, waters, and fumes is one of the feature characteristics of flexible plastic pipe used in the transmission of natural gas. Piping is impervious to chemical attack of acids, alkalis, sulfurous waters, and metallic salts.

Flexibility of the pipe permits the material to absorb vibration stresses caused by vehicles passing over the installation without developing leaks at the couplings. Initial installation is rapid, since the pipe can be curved to follow irregular ditch contours and eliminates the need for many fittings required by rigid pipe. (Fittings are available to join the flexible plastic pipe with established metallic systems.) Smooth internal surface of the pipe does not accumulate sediment, provides permanent full flow.

(Development of Carlon Products Corp., Dept. CP, 10225 Meech Ave., Cleveland 5, Ohio.

PROCESSING
AND
ENGINEERING
DATA section
on pages 182, 184, 186, & 188.


9 COPPER BUS BAR (NOT NEEDED FOR INSULATION AGAINST GALVANIC CURRENT)
LEAD PIPE
WATER SEAL LINE
MOTOR LEAD CONDUIT
5
2
3
8 IF NEEDED
7 IF NEEDED
1
6
LEAD PIPE
4 DRAIN FROM STUFFING BOX
INSULATED BOLTS REF. TO FIG. 12
1. Rubber hose insulates suction pipe to pump
2. Rubber hose insulates discharge pipe from pump
3. Rubber hose insulates water seal line to stuffing box
4. Rubber hose for drips from stuffing box
5. Rubber hose insulator in motor-lead conduit
6. Dry concrete foundation
7. Insulator—if no insulator in motor-lead conduit (bolts should also require insulating in this case)
8. Insulated coupling must be used if no insulator used in motor-lead conduit
9. Copper bus bar

ANOTHER CASE STUDY FROM THE WORTHINGTON FILES. This data sheet from the Worthington files indicates points at which an alloy pump should be insulated in order to eliminate stray-electric-current corrosion in an electrolyte circulating system. The solution to this problem was arrived at from very careful consideration and investigation by Worthington engineers working in conjunction with the pump user. The resulting installation—made some eleven years ago—was one of the first in the world where alloy (Worthite) pumps were used to circulate an electrolyte.

Another Pumping Problem That Called For More Than a Pump!

A check of the Worthington files would uncover many stories like this one. They're the best evidence we have of the "extras" you get with every Worthite* pump.

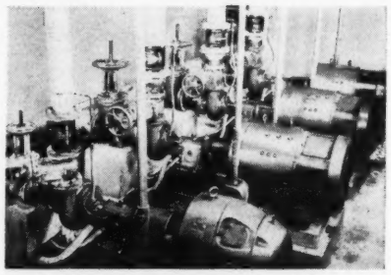
About eleven years ago Worthington specialists solved this problem of protecting pumps from stray current corrosion. As a result, Worthite pumps were installed in the manner illustrated above in the data sheet.

Today, after examination, there is practically no corrosion on the pumps. A life of 20 to 30 years is indicated for these Worthite pumps. Maintenance costs are a fraction of what they had been before. And the Worthite units required only 40 hp as compared to 75 hp for previously used (lead) pumps. They still deliver more electrolyte and have not fallen off in capacity after eleven years service.

During the same eleven years, copper and zinc refineries everywhere in the world have been specifying Worthite pumps for electrolyte circulation. Old refineries now modernize with them. Once again, Worthington's 111-year experience with pumping equipment helped to solve a tough problem for industry.

At Worthington, we'd like to hear about your pumping problems. Write Worthington Corporation, formerly Worthington Pump and Machinery Corporation, Centrifugal Pump Division, Harrison, N. J.

*Reg. U. S. Pat. Off.

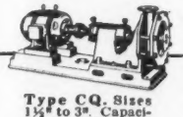


THIS ALLOY PUMP INSTALLATION FOR ELECTROLYTE CIRCULATION is comprised of these Worthite centrifugal pumps, 6-in. discharge by 8-in. suction. They circulate copper sulfate electrolyte and have been in service for eleven years without any indication of stray-electric-current corrosion. Note how pumps are insulated.

C.2.1

Types CG and CGL. Sizes ¾" to 10". Capacities to 5000 GPM; heads to 200 ft. Liquid ends of WORTHITE.

Type CF. Sizes 1" to 4". Capacities to 1000 GPM; heads to 130 ft. Standard, all iron and all bronze.



Type CQ. Sizes 1½" to 3". Capacities to 600 GPM; heads to 130 ft. at 1750 RPM. Closed impeller.

Type L. Sizes 3" to 8". Capacities to 2250 GPM; heads to 300 ft. Single stage volute. For general service.

WORTHINGTON

Centrifugal Pumps

The World's Broadest Line Assures You the Right Pump for Every Job

When inquiring check CP 2325 on handy form, pgs. 2-3

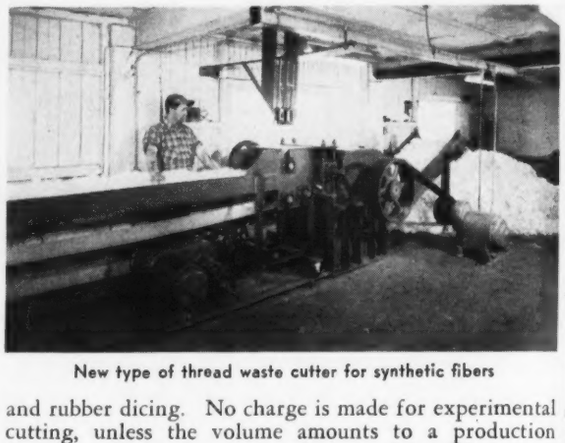
IDEAS

Offer lab facilities for testing varied cutting properties of sample material . . .

manufacturer of cutter machines extends service to industry at handling cost only

A completely equipped laboratory to which anyone can bring or send sample materials for test cutting has been set up by Taylor, Stiles & Co., at their Riegelsville, N. J., plant.

Cutters are of the most efficient, modern types and are designed for syntheic fibers, paper shredding, plastic and rubber dicing. No charge is made for experimental cutting, unless the volume amounts to a production quantity. Only charges are for actual handling costs.



New type of thread waste cutter for synthetic fibers

(Information supplied by Taylor, Stiles & Co., Dept. CP, Riegelsville, N. J.)

Air locks protect personnel against contamination in atom plants and laboratories . . .

poisonous product of nuclear fission requires "extra-ordinary" measures of control

Personnel working in atom plants and laboratories are being protected against deadly air-borne contamination by means of "air locks" spaced between "hot" and "cold" pressurized zones, it was disclosed recently at the spring meeting of the American Society of Mechanical Engineers held at the University of Washington, Seattle, Wash.

New materials produced by nuclear fission, "more poisonous than anything previously known," are being processed on an industrial scale, and call for "extra-ordinary measures" to provide adequate protection for personnel working in close proximity with this type of substance, the group was told by a staff engineer of the General Electric Company, Richland, Wash.

In addition to providing protective ventilation for normal processes which take place in hoods and equipment, design consideration must be given to the effects of all types of accidents, explosions, fires, spills, and other personnel hazards. This is achieved by compartmentation of the building so as to be compatible with efficient operation, and by design for controlled direction of air flow.

One method of controlling air flow direction is the provision of differential air pressure between areas of different degrees of hazard. Usually designated as "zones", uncontaminated areas are termed "cold", and the areas of greater risk are termed "hot". Zones of different hazard levels are completely separated structurally. Access between zones is through air locks. Within each zone air

is supplied to areas of least risk and exhausted principally from equipment, hoods, or areas of highest risk. Ventilation balance within the zone is such that flow through doorways is always toward the more hazardous side.

Air locks are not ventilated, but on opening the door toward the "hot" side, air will leave the air lock toward the lower pressure zone. When air lock door to the "cold' side is opened, air will flow from the higher pressure area into the air lock; thus, air movement is in the proper direction. Air lock doors may be interlocked to prevent simultaneous opening which might upset the ventilation balance.

A modulating damper is provided in the exhaust system to maintain a constant exhaust pressure in order to hold the quantity of air exhausted at a constant value. Separate modulating dampers maintain their respective zones at pre-set pressure levels.

Another method of designing for controlled direction of air flow is to devise an architectural and ventilation arrangement wherein air is admitted to the cold zones and exhausted from the hot zones. Both systems are reported effective, the choice being based on a detailed study of the operations performed in the building, heating and cooling loads, and structural and architectural arrangements.

With proper planning of space and processes it is frequently possible to provide a ventilation system (series flow) which will insure air flow in safe directions without zone pressure control. In the series flow system rather high rates of air change are required to satisfy comfort conditions in the zone of final air use. Special care must be exercised to prevent drafts from supply terminals and through doors. Excessive air movement may cause the spread of contamination within the "hot" zone or from an "intermediate" zone to a "hot" zone as well as personnel discomfort.

The problem of disposal of air-borne contamination after it is directed into the exhaust ventilation system is met with the removal of the particulate matter from the air stream by filters, while gaseous matter is removed by scrubbing. As a further safeguard, final discharge point of exhaust ventilation may be from a stack 200 or more feet in height. Where such control can be arranged, it is the practice to discharge process exhaust only during those periods when weather conditions are favorable to wide dispersion and consequent good dilution of the exhaust air.

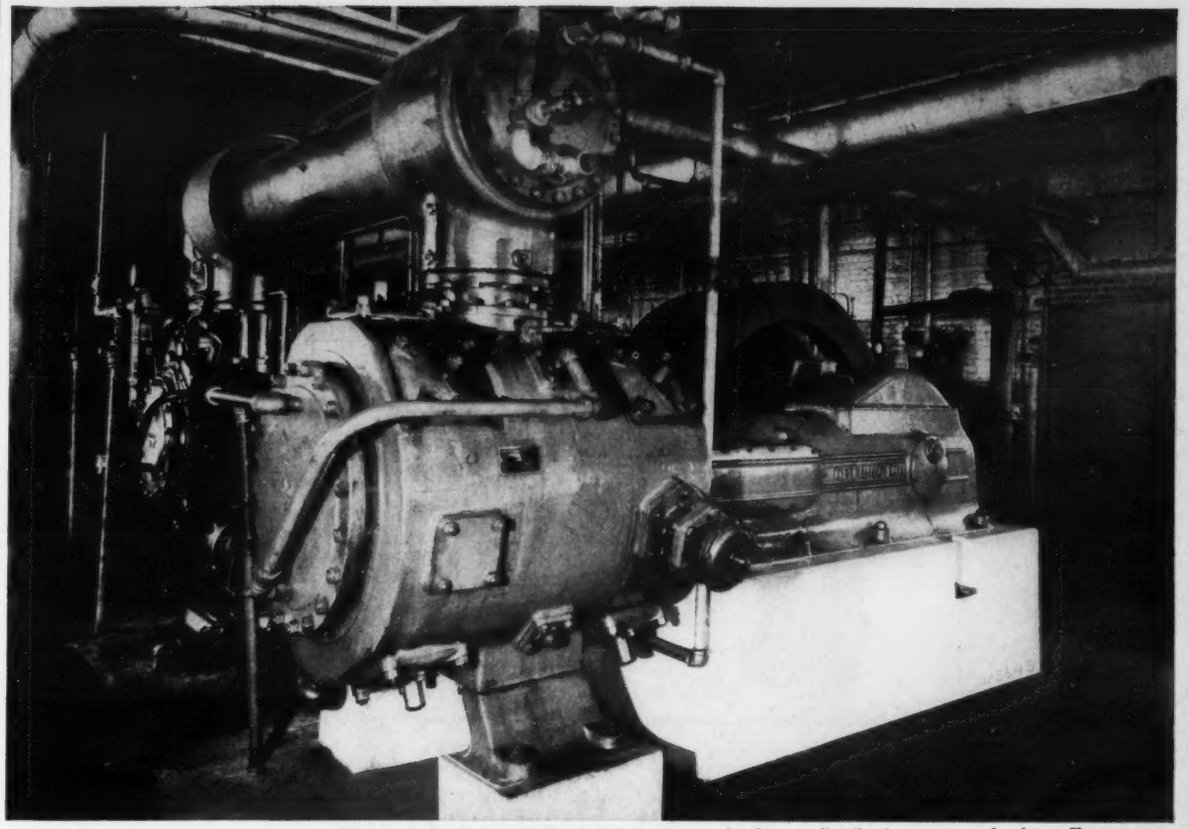
(From a report of W. W. McIntosh, GE staff engineer, before the ASME. More information can be obtained from the American Society of Mechanical Engineers, Engineering Societies Building, Dept. CP, 29 W. 39th St., New York 18, New York.)

Tells qualities of paint pigment with salt-fog test series

Valuable data from recent salt-fog and moisture-resistance tests of paint pigments are given in 12-page illustrated booklet.

Illustrations include photos, charts, and tables which treat such subjects as: paints used, applications, evaluation of the paints, electrographic printing, effect on moisture resistance, test program and findings, and pigment volume used in the tests. Of particular interest are charts showing comparative conditions of paints having different extenders, and visual observations on samples exposed 1000 hr in salt-fog chamber.

For copy of "Platy Pigments in Paint Systems" remit 25c direct to Bureau of Public Information, New York University College of Engineering, Dept. CP, New York 53, New York.



ONE OF FOUR WORTHINGTON GAS COMPRESSORS in the gas distribution system of a large Eastern gas company. Compressor is positive displacement reciprocating type with capacity of 125,000 standard cu ft of manufactured gas per hour. Maximum discharge pressure is 100 psi. Volume is controlled by Worthington's automatic variable capacity control.

When a large Eastern gas company needed another gas compressor . . .

. . . There was no question about which make should be selected!

The gas compressor in the picture had been working so well since 1949 that Worthington was the logical choice for the *next* new compressor to handle expanded capacity.

These Worthington features constantly increase the number of such choices:

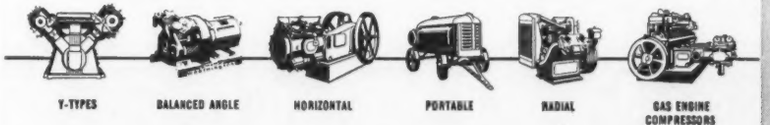
Accurate control of volume that is always assured with Worthington's automatic variable capacity control — acknowledged most accurate, flexible and simple control obtainable.

Worthington's exclusive Feather Valve*—simplest, lightest, most efficient ever made—eliminates valve problems. And Worthington's high-efficiency intercooler needs less water, less power.

Somewhere in the broad line of Worthington compressors, for air, gas or other "compressables", there is the one right type and size for your job. *Worthington Corporation, formerly Worthington Pump and Machinery Corporation, Compressor Division, Buffalo, N. Y.*

*Reg. U. S. Pat. Off.

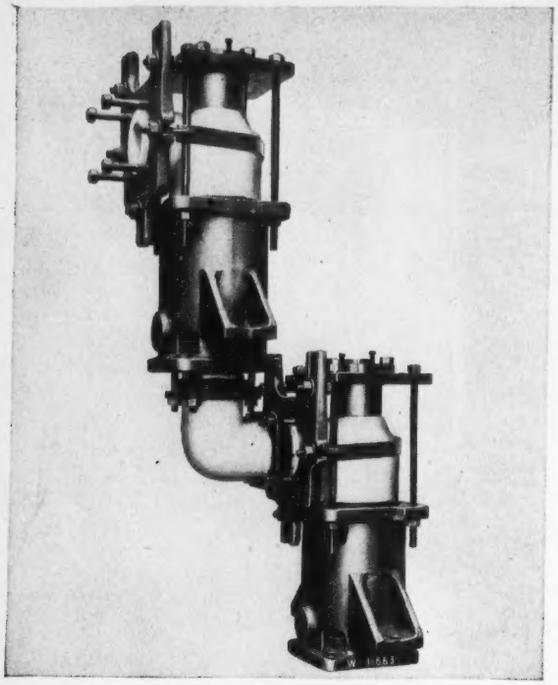
K.2.15



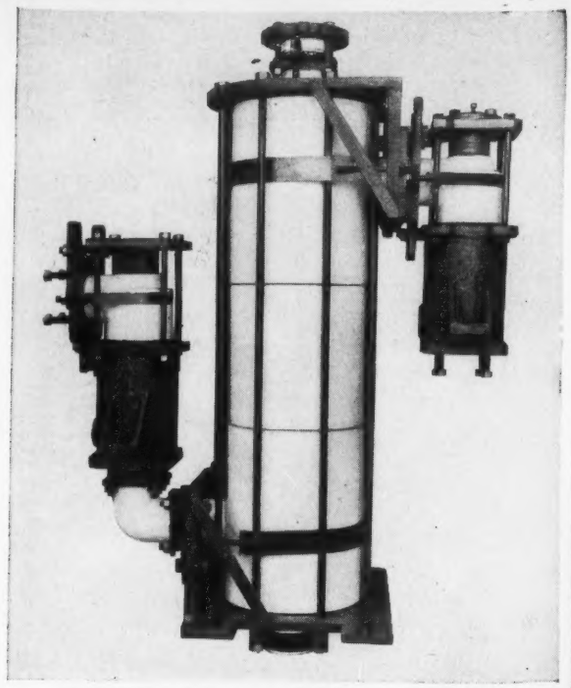
No Other Compressor Will Outperform a Worthington

WORTHINGTON
Compressors

When inquiring check CP 2326 on handy form, pgs. 2-3



Worthington two-stage non-condensing ejector—porcelain



Worthington two-stage condensing unit—porcelain

How To Maintain an Uninterrupted Vacuum

in the presence of corrosive vapors

Use a Worthington corrosion-proof steam-jet ejector. These are made in stock sizes and specially engineered for handling any corrosive vapor problem in the chemical field.

For corrosive vapors, these ejectors are made with impervious graphite nozzles and diffusers. Suction chambers are of porcelain, but these can also be furnished of impervious graphite. Porcelain diffusers are also available.

For corrosion-*resistant* usage, Worthington makes ejectors of bronze, stainless steel or Worthite (a special Worthington "super-stainless").

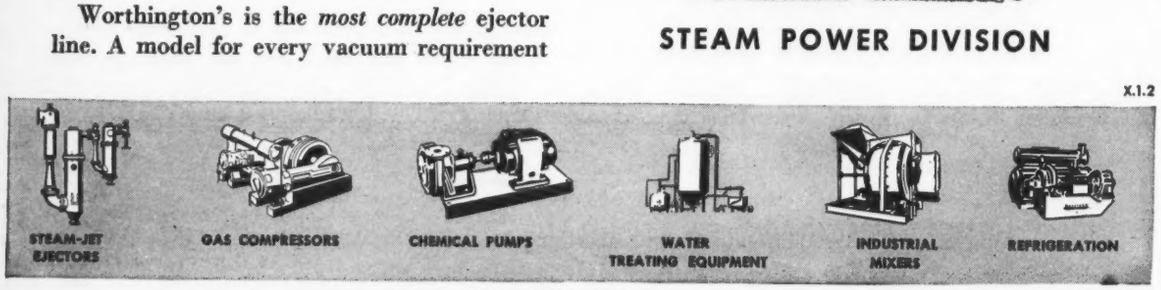
Worthington's is the *most complete* ejector line. A model for every vacuum requirement —from atmospheric to 50 microns absolute. Single and multiple stages. Condensing and non-condensing.

Put your problem—distillation, drying or any other vacuum problem—up to Worthington Corporation, formerly Worthington Pump and Machinery Corporation, Steam Power Division, Ejector Section, Harrison, New Jersey.

WORTHINGTON

STEAM POWER DIVISION

X.1.2



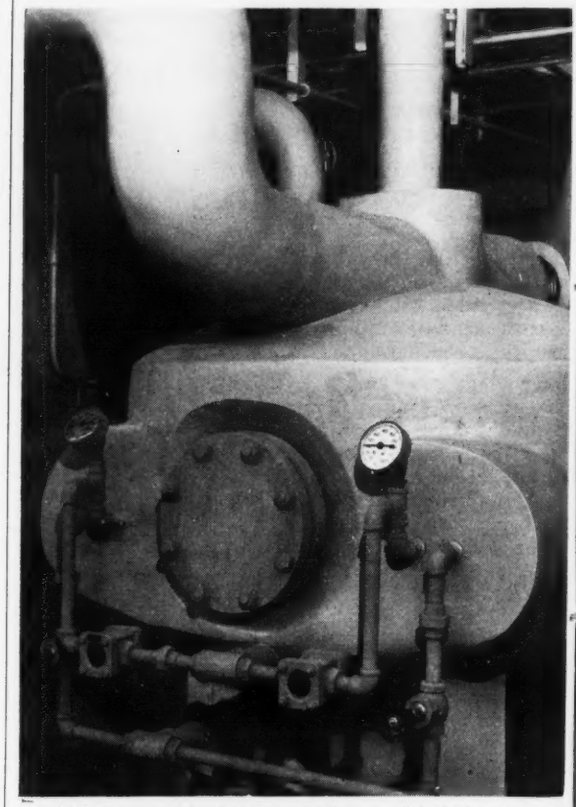
When inquiring check CP 2327 on handy form, pgs. 2-3

Careful maintenance of insulation is an investment resulting in better operation . . .

dividends are realized in prolonged life and added savings of fuel

Costly heat losses or operating inefficiencies occur in plants where insulation maintenance has been neglected. The need for maintenance, which prolongs life and reduces fuel consumption, may result from normal wear and tear, from failure to repair or replace insulation damaged or removed during alterations, or from routine equipment maintenance work.

Most frequently, the need for insulation repair on pipe lines can be noticed around flanges and fittings which are opened for inspection or other purposes. Pipe insulation adjacent to chain hoists, doors or other moving objects may



Maintenance of insulation materials pays off in fuel savings

be damaged if not properly protected. Loose tie wires or bands and damaged canvas covering should be checked and repaired. Small fittings insulated with cement are more likely to need periodic reinsulation than pipes and larger fittings having molded insulation.

Equipment is likely to show most need of insulation repair around manholes or other openings where the edges are subject to hard contact and abrasion. Vibrating or rotating equipment, when insulated, should be checked frequently to assure the soundness of the fastenings. Loose tie wires or sheared stud welds may allow the insulation to sag or become completely detached.

One of the factors causing neglect of insulation maintenance is the need for stocking insulation materials of various types and sizes such as blocks, pipe sections, cement, canvas, wires and bands. This problem can be solved by

arranging with an insulating contractor for periodic inspection and maintenance.

(Information supplied by The Magnesia Insulation Manufacturers Association, Dept. CP, 1317 F Street, N. W., Washington 4, D.C.)

Introduce X-ray film family covering wide range of radiographic needs . . .

can be used with low or high kv X-ray exposures, or with Ra or Co gamma radiation

Being offered is a group of four industrial X-ray films which promise to meet the diversified needs of the industrial and scientific radiographer. The films can be used with low or high kv X-ray exposures or with radium or cobalt gamma radiation. They are reported to give brilliant radiographs of high diagnostic quality.

Film-type designations and a description of some of their salient features follow:

Superay "A" is especially suited for industrial uses where the recording of small defects and fine structural detail is essential. High contrast, fine grain, and moderately high speed make it a desirable medium for this purpose. Inherent high radiographic contrast of film will produce excellent radiographs where gamma radiation with cobalt or radium is employed to check pipe welds or complete castings. It is also recommended for certain types of diffraction analysis requiring fine definition.

Superay "B", re-introduced for the first time since before World War II, has the finest grain and highest contrast of any film in the group. It is designed for use when optimum radiographic definition, sharpness, and contrast are desired in preference to speed of recording. Ordinarily used between lead screens with high voltage X-rays and gamma rays, this film is equally useful without screens with low-voltage X-rays. It has the ability to combine a high degree of detail visibility with a long scale of gradation — a combination necessary for radiography of objects of wide thickness densities.

Superay "C" is a new non-screen X-ray film. It provides maximum speed with the best practical balance in contrast and grain size when used without screens. It is particularly adapted for industrial radiography where rapid exposure, moderately high contrast, and good detail are demanded to satisfy routine inspection requirements. Exposed and developed to high photographic densities, this film will produce high contrast; if developed to lower photographic densities the film exhibits considerable latitude.

It fills need for fast film for direct-radiation exposures; registers X-rays generated at voltages up to 2000 kv; records gamma rays from radium or radioactive isotopes; offers controllable contrast and maximum speed of recording in X-ray diffraction analysis.

High Speed is recommended for those industrial applications where a) exposures are normally made with screens of the calcium tungstate type, b) where X-ray equipment of limited output is employed and material to be X-rayed is of excessive thickness. Used with screens this film has excellent resolution and wide latitude, and will record detail over a considerable range of material thicknesses.

It can be exposed and developed to relatively high photographic densities, and the light-blue tint of the safety base enhances inspection on standard illuminators.

(Available from Ansco, a Division of General Aniline & Film Corp., Dept. CP, Binghamton, N. Y.)

The Ten Leading Makes Of Vertical Turbine Pumps
√ Indicates Feature Is Standard

Standard Features	Worthington	Pump A	Pump B	Pump C	Pump D	Pump E	Pump F	Pump G	Pump H	Pump I
Seals above and below drain ports (oil-lubricated model)	√				√					
Wearing rings	√				√			√		
Enclosed impellers	√	√	√	√	√	√		√	√	√
Bronze bushings in bowl assembly	√		√	√	√	√		√	√	√
Flanged and bolted bowls on all sizes	√						√		√	√
Sand collars at both ends of bowl assembly (water-lubricated model)	√	√								
Grease-packed bottom bearing	√	√		√						
Choice of oil or water lubrication	√	√	√	√	√	√		√		

CHECK WORTHINGTON AGAINST THE REST
Only Worthington has all 8 vital design features as standard equipment.

Have you ever considered a vertical turbine pump for your industrial applications?

If you haven't, you may be missing a good bet.

For many years the vertical turbine pump was thought of as having only one application—deep well pumping. Recently, however, this efficient liquid handler has been given many other jobs, so that today we're not sticking our necks out when we say: it's an extremely *versatile* pump.

Let's take a look at the four inherent characteristics that make this pump really *versatile:*

1. THE DRIVE UNIT IS REMOTE AND SEPARATE FROM PUMPING ELEMENT. The pump always operates submerged. No priming. No expensive dry pits. No suction or NPSH problems.

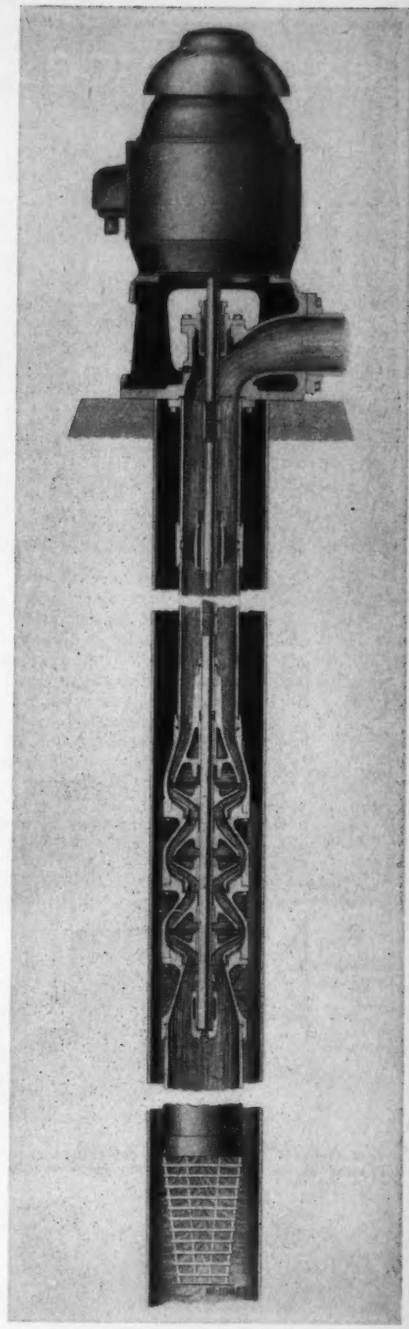
2. SPACE REQUIREMENTS AT A MINIMUM. Because of its vertical design, the vertical turbine pump takes less floor space than other types.

3. MECHANICAL AND HYDRAULIC FLEXIBILITY. Will operate with any type of drive. Discharge can be positioned to user requirements. Can be close coupled or several hundred feet long. Meets head and capacity requirements by varying the number of duplicate stages.

4. IT'S A SIMPLE MACHINE. Unidirectional thrust minimizes alignment problems. Easy maintenance, few moving parts, little friction, long life.

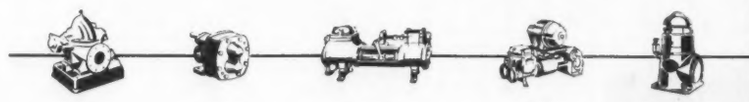
If you think a Worthington vertical turbine might be your answer to a pumping problem, or if you're not quite sure about it—we'd like to hear from you. Remember, Worthington, as the oldest manufacturer of pumping equipment, has the newest and broadest line of vertical turbine pumps.

Send complete data on your application mentioning capacities. Worthington Corporation, formerly Worthington Pump and Machinery Corporation, Vertical Turbine Pump Division, Denver 16, Colorado; Succasunna, N. J.



TYPICAL SECTION of the Worthington water-lubricated vertical turbine pump that gives most efficient pumping performance at lowest possible cost.

D.1.11

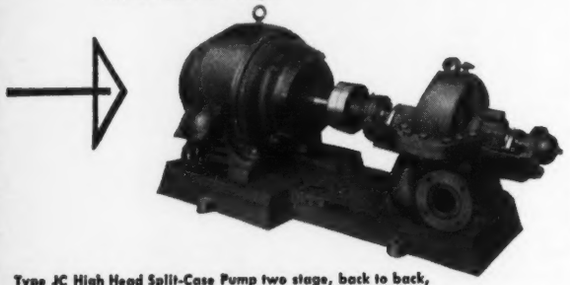


The World's Broadest Line Assures You The Right Pump For Every Job

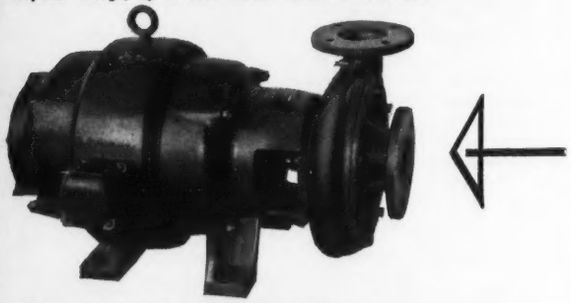
WORTHINGTON
Vertical Turbine Pumps

When inquiring check CP 2328 on handy form, pgs. 2-3

Extensive experience with all kinds of pumping applications makes any advice from a **WEINMAN** representative sound advice. He is backed by an organization which devotes its entire skill to the continuous improvement of one product—pumps. His head and his briefcase are crammed with ideas and engineering data on how liquids can be handled most effectively. This data plus common sense gained through experience can be applied to your problem to get the results you need. Plan to talk over your pump problems with a specialist — just write, wire or phone **WEINMAN**, Career Men in Pumps.



Type JC High Head Split-Case Pump two stage, back to back, impeller design, up to 600 G.P.M., heads to 600 feet.



Unipump for general service where space is limited, up to 1000 G.P.M., heads to 500 feet.

Built by Centrifugal Specialists
The WEINMAN Pump Mfg. Co.
294 SPRUCE STREET • COLUMBUS 8 • OHIO

When inquiring check CP 2329 on handy form, pgs. 2-3

Bureau of Mines Pilot Plant Proves Lignite Gasification Feasible

Grand Forks unit making gas high in CO and H_2 which is suitable for many chemical processes and syntheses

THE United States has more than 355-billion tons of recoverable lignite, mostly in North Dakota, with lesser amounts in Montana, Texas and 12 other states. It has been mined for use as a fuel, but has a lower heating value than bituminous coal — about 6800 vs 14,000 Btu per pound on a moist basis. However, if the 30 to 40% moisture in the mined lignite is driven off, the heating value rises to 10,600 Btu per pound.

While today lignite is used almost exclusively for heat and power, the most promising new use for the material in the near future appears to be gasification to a water gas consisting chiefly of carbon monoxide and hydrogen. This gas could be used in many chemical processes and syntheses, including the Fischer-Tropsch synthesis. The ungasified material, about 10 to 15% of the charge, is high in ash but burns easily and can be used as a fuel.

Since 1945, the Bureau of Mines, Department of the Interior, has been working on the development of a gasification process using lump lignite as a raw material. The work, conducted mainly at Grand Forks, North Dakota, has brought out what seems to be the first feasible process. Gasification is accomplished in an annular reaction space

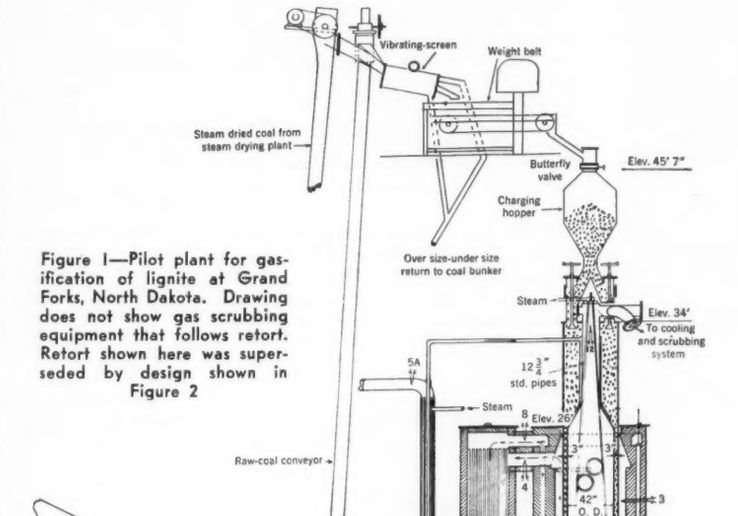


Figure 1—Pilot plant for gasification of lignite at Grand Forks, North Dakota. Drawing does not show gas scrubbing equipment that follows retort. Retort shown here was superseded by design shown in Figure 2

Operating Data
Lignite Gasification at Bureau of Mines Pilot Plant at Grand Forks

Type of lignite fed	Dakota Star
Lignite analysis as received	
% Moisture	36.0
% Volatile matter	27.7
% Fixed carbon	30.5
% Ash	5.8
Btu per pound	7060
Percentage lignite gasified	72.3
Steam with lignite, pounds per hour	49
In char zone*	250
Net Btu used per cu ft gas made	117
Lb lignite per Mcf gas	44.7
Dry residue, pounds per hour**	114.4
Gas, Mcf per ton lignite	44.72
Btu per cubic foot	292
Ratio H_2 to CO	2.97
Analysis of gas	
% CO_2	18.1
% Illuminants***	0.3
% CO	20.0
% H_2	59.3
% CH_4	1.9
% C_2H_6	0.2
% N_2	0.2
Sp g (air = 0.1)	0.542

*This steam is introduced at bottom of annular section and flows upward, countercurrent to char. It is preheated by passing the line carrying it through the retort from top to bottom.

**Total residue calculated from ash and carbon balance; includes losses such as char dust from cyclone, and fine dusts carried away in cooling water.

***Composition of illuminants estimated as $C_{2.8}H_{5.6}$.

three inches wide and twenty feet high, which is formed by two concentric metallic cylinders having approximate diameters of 48 and 42 inches respectively (see Figures 1 and 2). The large cylinder is heated from the outside by three rows of gas burners located at different levels of the cylinder. Incoming combustion air to the burners is preheated by heat exchange with burner products of combustion which are at 1600°F.

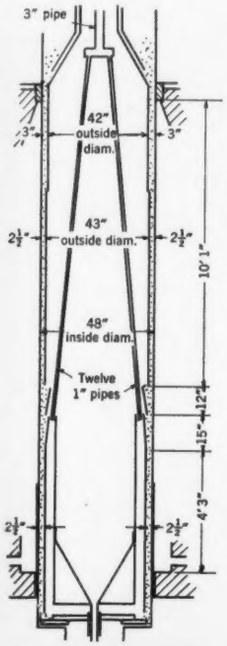


Figure 2—Later retort design than shown in Figure 1. This is best for highest capacity and with only a moderate amount of blown-over char

Lump lignite is fed to charging dome on top of the gasifier retort by gas-tight feeding device, and descends slowly through the annular reaction space, along with superheated steam which meets it at the top. The lignite first dries and then heats up to the temperature where thermal decomposition of the coal substance and reaction of the steam with the carbon occur. As the temperature progressively increases toward the lower section of the annulus, the rate of gasification increases and more and more gas is formed. Temperatures are as high as 1925°F in the lower part of the combustion chamber.

Gas leaves the annular reaction

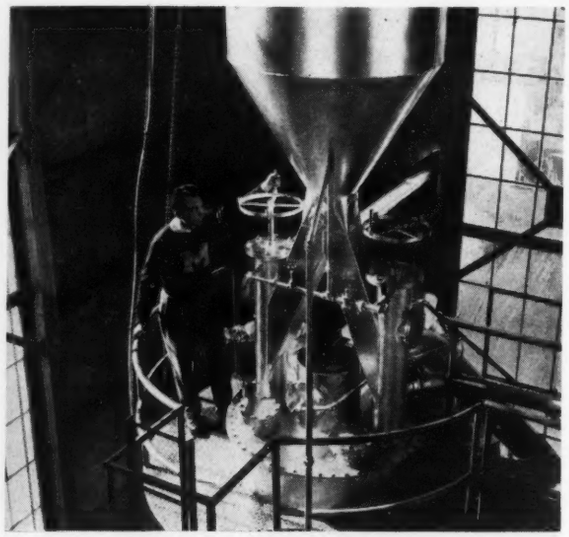


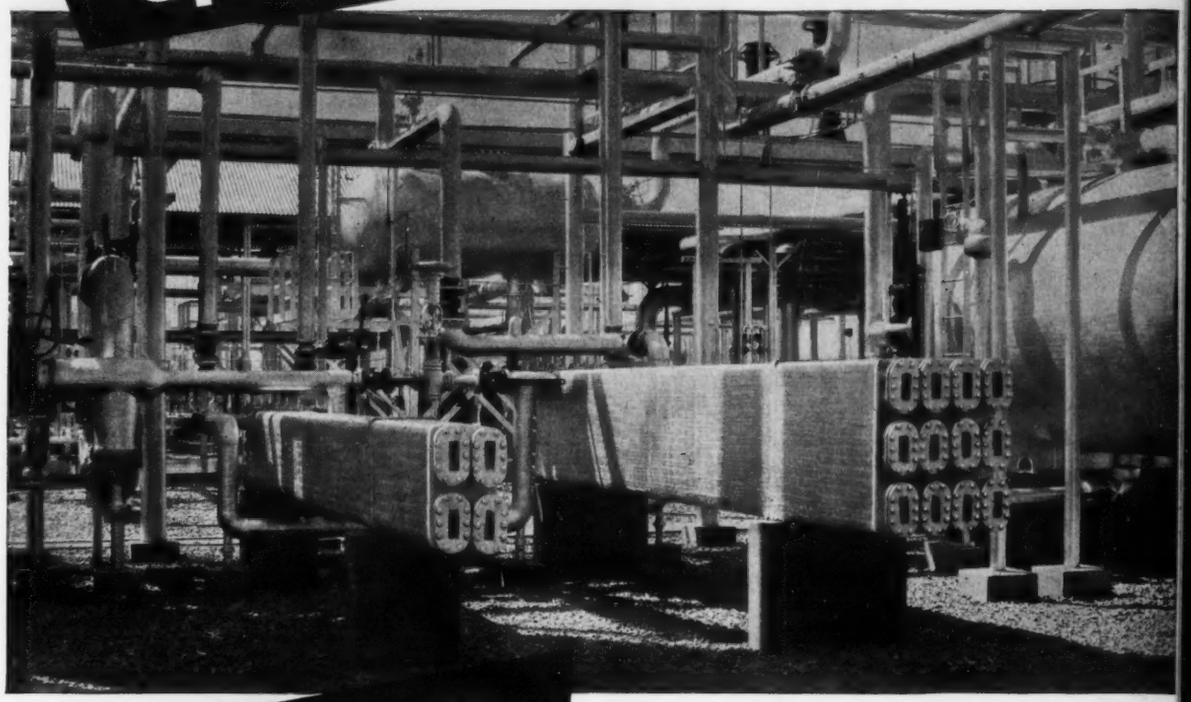
Figure 3—Here are the charging hopper and valves atop the Grand Forks retort

zone through the gas off-take at its lower end and travels upward through the inner retort tube, transferring part of its sensible heat through the wall to the descending lignite. The gas subsequently passes through a scrubbing system where it is cooled and cleared of dust. Char refuse is discharged from bottom of the retort.

Advantage of the process is the uniformity of rate of gas production and composition, once experimental conditions

(*Continued on next page*)

Assure Continuous Operation in your plant



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CONCORD AIR — An extra quality, exceptionally rugged hose for toughest use on air drill and pneumatic service in mines, quarries and construction jobs. Non-porous tube resists heat and oil. High tensile cotton yarn braid reinforced carcass. Tough grey cover resists cutting, gouging, abrasion. 7 sizes from ½" 2-braid through 2" 3-braid. 200 to 300 lbs. working pressure. Maximum length 50'.

BAY STATE AIR DRILL — For heavy construction work in mines, quarries, tunnels and wherever large size hose is required for long service. Smooth black tube resists heat and oil. Carcass of strong, rubber-impregnated multiple ply woven duck. Rugged, heavy-gauge red rubber cover resists severe weather extremes, cutting, abrasion. 9 sizes stocked from ½" to 4". Working pressures from 150 to 225 lbs. Max. length 50'.

AUROCHS AIR — For portable air compressors, jackhammers, rugged industrial and construction work. Smooth, black, non-porous tube resists heat and oil. Carcass: multiple ply, rubber-impregnated, rugged woven fabric. Tough black cover resists weather and abrasion. Stocked sizes: ½", ¾", 1". 200 lbs. working pressure. Maximum length 50'.

VIM AIR — For general industrial use, on compressors and pneumatic tools. Black tube resists oil and heat. Husky cotton yarn braids. Smooth, red cover resists weather, abrasion. 8 sizes stocked, ¼" 2-braid to 1" 3-braid. Working pressures: 150 to 225 lbs. Maximum length 500'.

BULL DOG VARI-PURPOSE AIR — For a variety of jobs including handling of air, water, oil, gasoline, kerosene (not for paints, lacquers, lacquer-solvents). Black, synthetic tube resists oil and heat. Carcass is braided rayon cord, high strength, super flexible. Smooth, brown, tough synthetic cover resists oil, abrasion, sunlight. 11 sizes stocked from 3/16" one-braid to 1" 2-braid. Working pressures: 200 to 300 lbs. Maximum length approximately 500'.

When inquiring check CP 2331 on handy form, pgs. 2-3

IDEAS

(Continued from preceding page)

are set and the gasifier is in balance. Heating value of the gas varies from 275 to 300 Btu per cubic foot, depending on gas composition. This does not change more than plus or minus 1½% over a period of 24 hours of gasifier operation.

Depending on operating conditions, gas yield per ton of natural lignite can be rather widely varied. Average yield since gasifier has been in operation is about 44,750 cubic feet per ton of lignite. The proportion of hydrogen to carbon monoxide in the gas has been varied from 1.8 to 9.0, and the rate of gas production has ranged from about 145,000 to 400,000 cubic feet per day. Work is now under way to increase rate of gas production.

A 95 to 96% pure hydrogen can be obtained by catalytically converting with steam the carbon monoxide in the gas to hydrogen and carbon dioxide, and scrubbing out the latter.

In spite of the high temperatures, extreme temperature gradient, and highly corrosive conditions to which the present externally heated metallic cylinder has been subjected (for some 4740 hours), it shows no scaling on the outside and very little evidence of corrosion on the inside. The cylinder is a chromium-nickel steel containing 25% Cr and 20% Ni.

(The editors thank personnel of the Charles R. Robertson Lignite Research Laboratory of the Bureau of Mines, Department of the Interior, Grand Forks, North Dakota, for their help in preparing this article.)

Strong lap joints on aluminum sheets made without weld or rivets . . .

resinous adhesives are derived from ethoxylene oxide compounds and resist acids

An adhesive strong enough to make lap joints in aluminum alloy sheets for airplane construction, and with shear strength sometimes higher than spot welding and riveting, has been developed by the Ciba Company, Inc., Kimberton, Pa. It is reported that in some instances the newly developed adhesives, highly resistant to acids and alkalis, have the full strength of Alclad aluminum.

Resinous adhesives tested by the company consist of many variations of a new group of ethoxylene com-

pounds with acid anhydrides, amines, and other compounds as hardening agents. All of the resins used are thermosetting compounds which cure without evolution of water or volatile matter at room or elevated temperatures. Use of this class of resins solves many problems that were previously difficult; for example, the bonding of metallic materials to non-metallics and unlike metals to each other.

Shear tests are made on a hydraulic testing machine of 12,000 lb capacity. Test specimens consist of two 1"

Remember — the trade marks "tt" and "TUBE-TURN" are applicable only to products of TUBE TURNS, INC.

Engineered for efficient flow

EFFICIENT FLOW in piping systems is worth striving for . . . it saves kilowatt-hours and avoids over-investment in equipment. That's why, on this TUBE-TURN Welding Elbow, so much engineering attention is devoted to true circularity, smooth inner walls, and exact radius. They all contribute to minimum flow resistance and reduced pressure loss.

When you specify TUBE-TURN Welding Fittings and Flanges you are specifying careful engineering. Get in touch with your nearby TUBE TURNS' Distributor. You'll find one in every principal city.

Write Dept. KK-5 for free booklet "Pipe and Fitting Materials" which gives specifications, properties and welding procedures for various materials.

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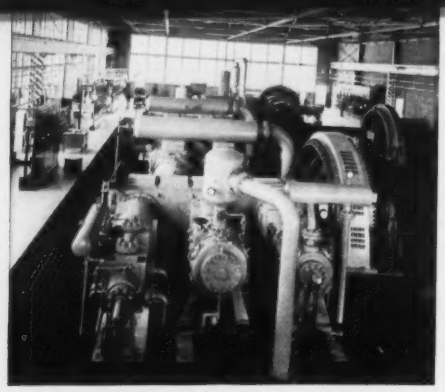
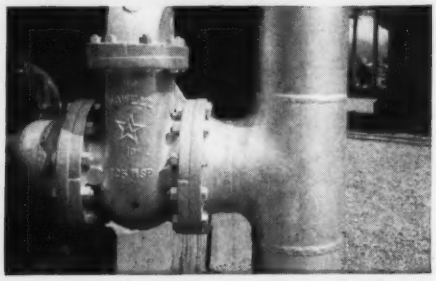
HOW CHEMICAL PLANT INSURES SAFE PIPING

Where leakproof piping is imperative... TUBE-TURN Welding Fittings are on the job!

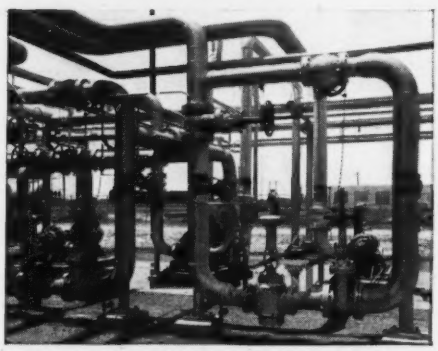
Piping at new Mississippi Chemical Corporation plant handles explosive gases and acids at high pressures. That's why leakproof welded piping was specified, and TUBE-TURN Welding Fittings and Flanges used throughout. Process piping handles hydrogen, nitric acid, anhydrous ammonia, etc. Engineering and construction of entire plant, which produces synthetic nitrogen fertilizer, was handled by The Girdler Corporation.



Design and installation of piping was simplified by obtaining all the necessary types of welding fittings from one reliable source. TUBE TURNS, INC. offers the world's broadest line of welding fittings and flanges—available in a wide range of types, sizes, and more than 40 different alloys.



125-lb. cast iron valve is secured to process line with TUBE-TURN Welding Neck Flanges. True circularity and uniform wall thickness of TUBE-TURN Welding Fittings, such as Welding Tee (right) and Welding Reducer (left) assure proper fit and speedy fabrication. Welders know they can depend on accurate line-up with TUBE-TURN Welding Fittings.



Welded piping using TUBE-TURN Welding Fittings keeps flow resistance and pressure drop to a minimum —an important consideration where so much piping is used. The complete Mississippi Chemical plant is noteworthy for high efficiency throughout . . . unit energy input is lower than in any other similar plant.

Want Materials Data?

Tube Turns, Inc. has prepared a booklet giving specifications, properties, and welding procedures for different pipe and welding fitting materials. If you'd like a free copy just send this coupon.

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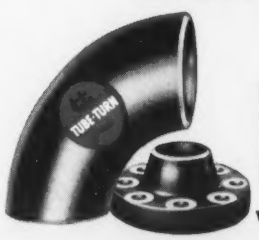

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strips of 16-gage Alclad al
an overlap of ½" to form
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square inch before failu
loads are recorded. Leve
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In preparation for tests,
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pairs of sheets are overla
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(Shear tests are made on
draulic testing machine m
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proven on wartime airs
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Steel matting used on emer
war is now solving a rath
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Loaded fork truck moves w
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(Information supplied by
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pair of sheets. One-half inch strips
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pecimens.

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trucks out of mud aid . . .

time airstrips, steel matting now serves
dustry

on emergency airstrips during the past
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moves with ease, above soft dirt, with steel matting

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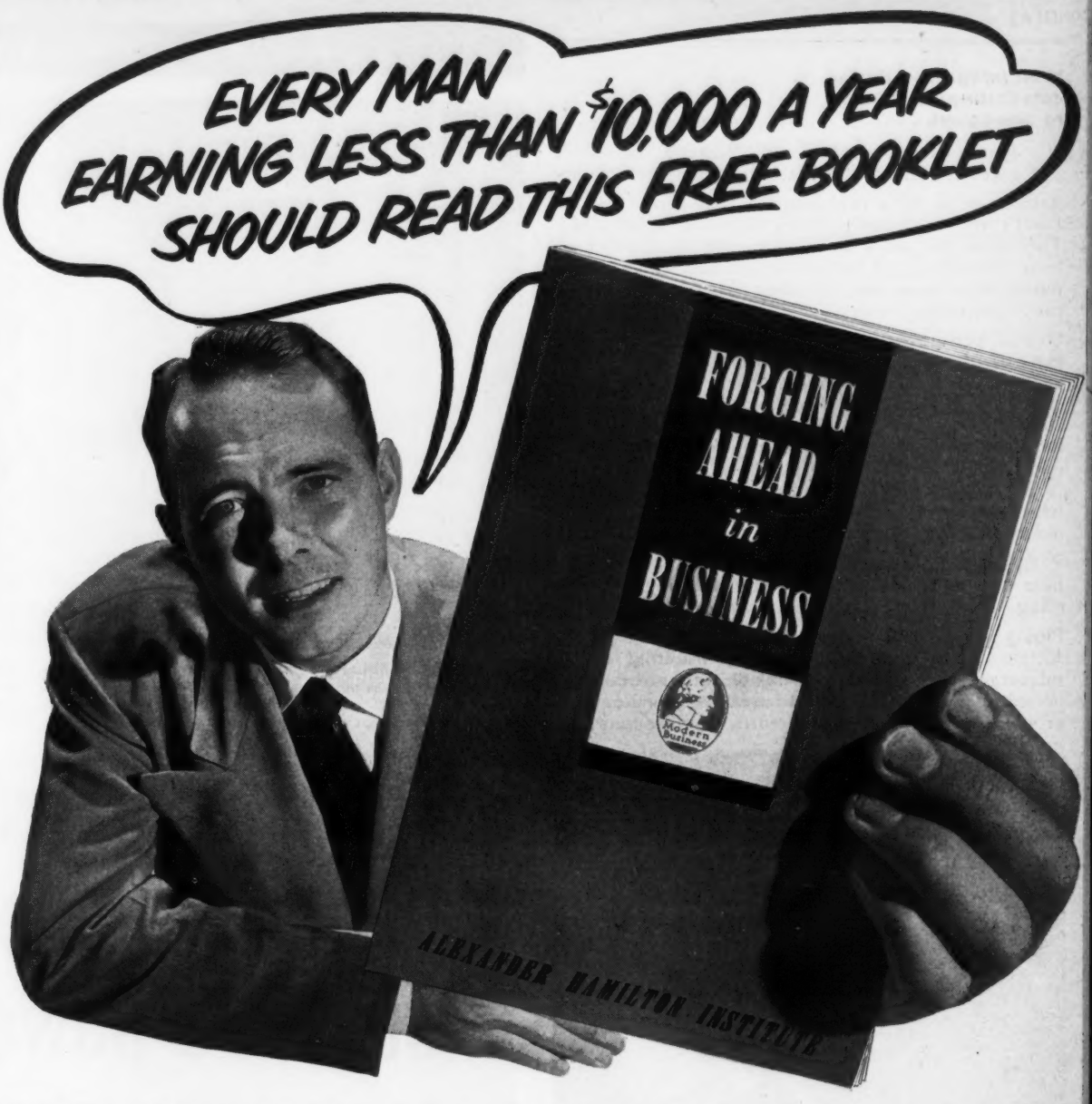
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Well integrated design cuts testing costs to one-fourth . . .

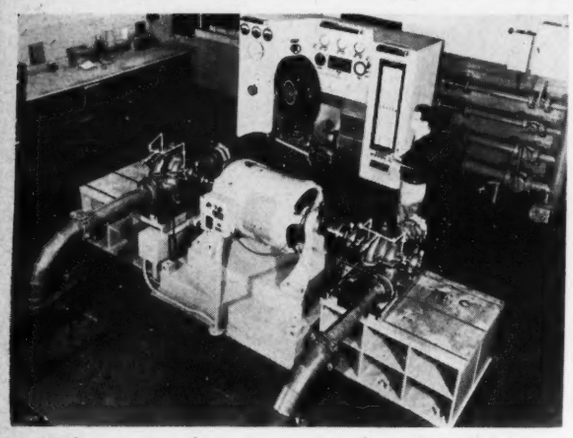
dynamometers, stroboscopes, Venturis, laboratory gages are all used in checking pump performance

Results are in on a twelve-month trial period for De Laval's centrifugal pump testing station at Trenton, N.J. They show that while actual operating conditions have been duplicated, and test results attained without theoretical corrections, cost of testing the pumps has been cut 75 per cent.

Overall performance is not attributed to any special piece of equipment, but rather to the integrated design of the whole station. For instance, test stand dynamometers are mounted on automatic lifts between prealigned pump bedplates. Pumps are anchored on either the right- or left-hand bedplate (depending on direction of drive), dynamometer is raised by push-button-controlled self-locking gears, and coupling is accomplished with specially made sliding devices and permanently mounted bolts.

Pumps up to six-inch diameter discharge are handled here with signal and safety features to assure safe handling.

Piping system simulates actual field conditions. Pump suction piping includes a movable manifold deeply submerged in a vortex-free pool of water. Interconnected reservoirs of the system have a combined capacity of 400,000 gallons. Special eccentric pipe reducers provide a means of piping pump suction to the manifold and quick-connecting adapters are used for pipe connections. Water is discharged through a flexible hose that carries liquid into a pipe system below the pumping level.



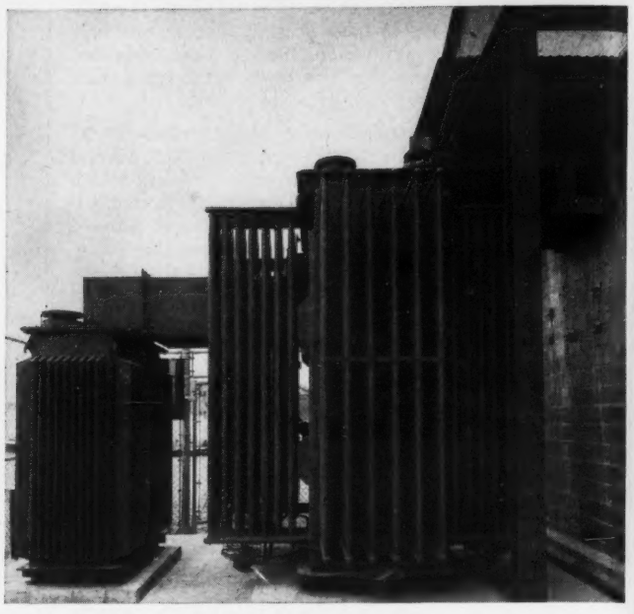
Bird's eye view shows dynamometer (center) flanked by right- and left-handed pumps. Control panel is in background with manometers mounted in black frame at its right end

In operation, water is metered through a bank of calibrated Venturis that can be operated singly or in parallel. Head for the system is low — a motor-operated valve is used to adjust friction to higher values during tests. The whole piping system is so designed that it is free of air locks, needs no priming.

Readings are made at a central location. This control panel has Venturi manometers so calibrated that they can be read directly in gallons per minute and closer than is possible with a conventional scale. Given flows are set up on pushbuttons by operator. Since the in-

A PHOTO-REPORT ON MODERN

New pumpless rectifiers in ratings of 750 kw and above, made possible by G-E semi-permanently sealed tanks, minimize vacuum losses, provide high service reliability. Maintenance is reduced because vacuum pumps are eliminated, and moving parts are at a minimum.



Outside the building at Oldbury's Niagara Falls plant and throat-connected to the rectifier equipment inside, is this G-E 12,000-volt step-down transformer. Induction voltage regulator at left, with taps for load ratio control, provides smooth, stepless voltage adjustment from 300 to 375 volts.

First pumpless rectifier in electro-chemical industry cuts d-c power-supply costs!

New G-E power-conversion package in larger ratings eliminates vacuum-pumping equipment, saves on installation, operation and maintenance

Latest example of G-E pioneering in power rectification is this recent installation—at Oldbury Electro-Chemical Company's Niagara Falls plant—of the electro-chemical industry's first pumpless mercury-arc rectifier. This new development, by eliminating vacuum pumping and combining the entire rectifier assembly in one compact, integrated unit, introduces savings like these:

Cuts installation costs—Unit is factory-wired for quick connection, needs no special foundations, and takes up less building space. *Cuts operating costs*—No vacuum pumping losses are sustained. *Cuts maintenance costs*—With a minimum of moving parts, periodic inspections are reduced. Moreover, service reliability is increased—employees are protected by the dead-front metal enclosure—and downtime is reduced because of the speed with which a spare tank can be installed if needed.

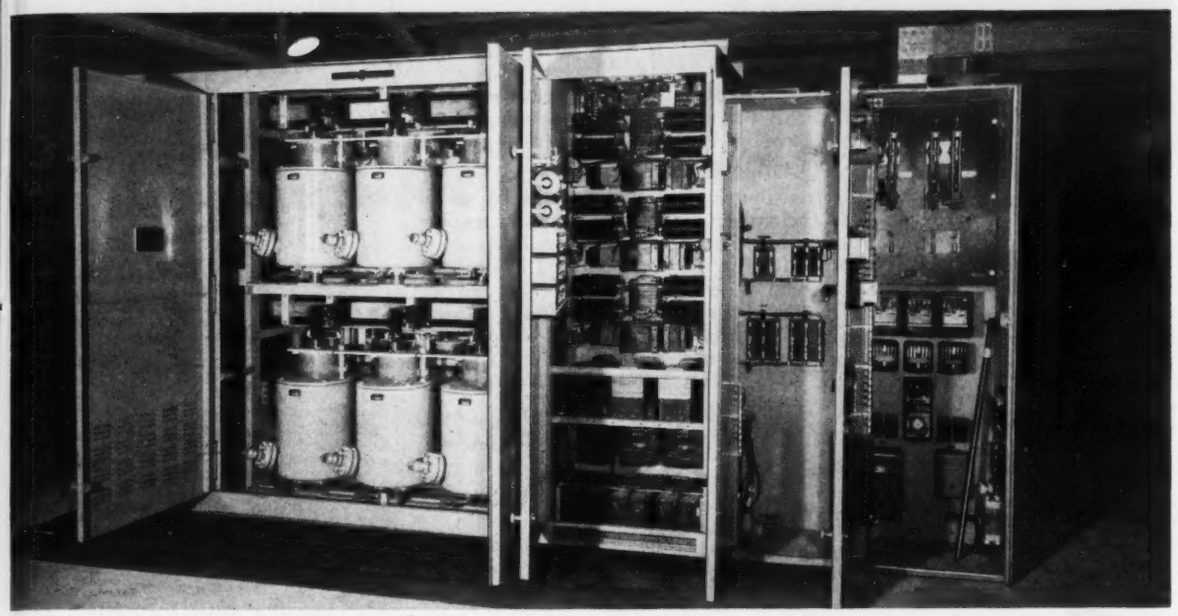
If *your* chemical-plant operation requires reliable, low-cost d-c power supply, investigate these new G-E pumpless rectifiers. Ask your G-E representative for more information, or send for new Bulletin GEA-5569. *General Electric Company, Schenectady 5, N. Y.*

D-C POWER SYSTEMS

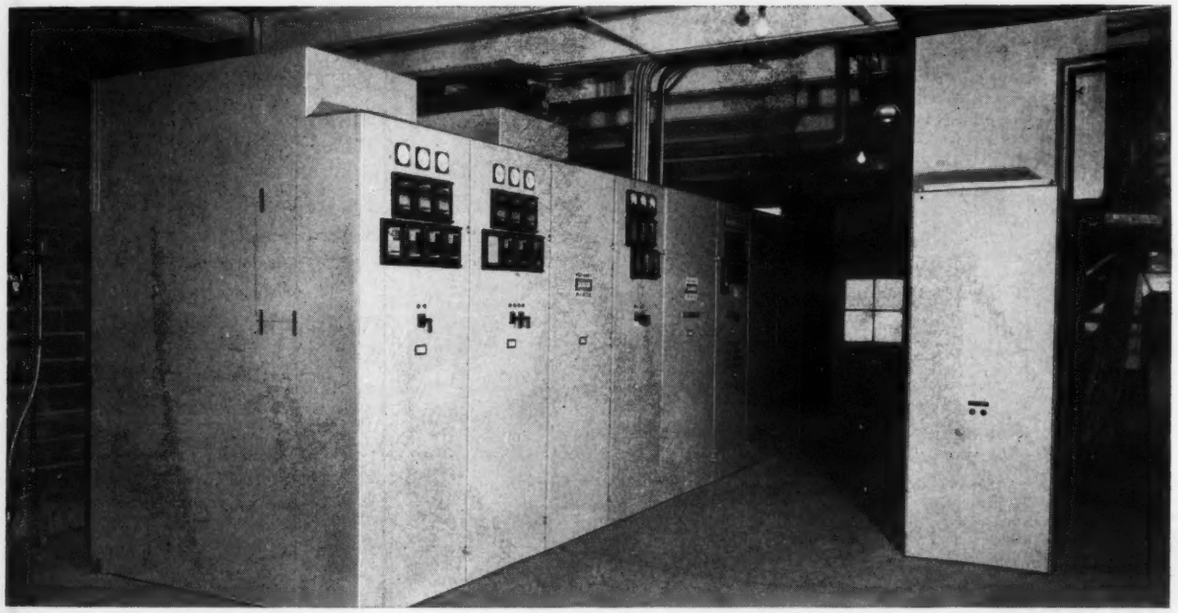
for electro-chemical plants

NEW G-E MOTOR SELECTION AND APPLICATION COURSE can help train your chemical plant electrical personnel, increase their value to you. Find out all about this "More Power to America" program by sending for free 16-page illustrated brochure, Bulletin GED-1500.

CHEMICAL-PLANT ELECTRIFICATION



Compact and co-ordinated, G-E pumpless rectifiers fit in smaller buildings, save up to 25 per cent in building costs. Metal-enclosed assembly includes rectifier tanks, excitation cubicle, and rectifier auxiliary control. Factory-wired, they arrive ready to connect and operate.



Completing the package at Oldbury—to provide everything needed from incoming a-c line terminals to d-c outgoing feeders—is this G-E, 500-mva metal-clad switchgear, located in the basement. It includes one feeder and an auxiliary compartment for the rectifier. Unit at right is the draw-out cathode breaker section for protection of rectifier. Metal-enclosed for personnel protection, it pulls out easily to provide ample room for inspection.

GENERAL ELECTRIC

662-38

When inquiring check CP 2334 on handy form, pgs. 2-3

stallation is permanent, extremely sensitive pressure gages can be used. The three gages on the panel read directly in feet of water up to 350 feet. Supplementary manometers are also included. A special vertical trap permits suction lift to be referred to a constant water level.

Speeds are conrtolled by rheostat and a combination of synchronous electric tachometers and stroboscopic devices providing a calibration accuracy of one rpm.

An actual test begins when the test engineer checks an engineering order card with stated requirements for these pump and motor quantities: discharge pressure, suction head, rate of flow, specific gravity, net positive suction head, submergence, horsepower required, and (for the motor) full load speed, voltage, and horsepower. Conditions are set up to conform with the actual service for which the pump is intended and data are recorded at six test points. Readings are only made when operation has stabilized. All procedures used conform with latest hydraulic codes.

After testing, pumps are put through a mechanical inspection and such factors as vibration, noise, and temperatures are recorded.

(Courtesy of De Laval Steam Turbine Co., Dept. CP, Trenton, N.J.)

Combustion of waste sulfite liquor may solve disposal problem in paper mills . . .

preheated liquor burned in refractory-lined furnace without use of auxiliary fuels

Spring meeting of American Society of Mechanical Engineers revealed a way to burn calcium-base waste sulfite liquor without use of auxiliary fuels. Report submitted to the society by H. A. Sorenson, Washington State College, stated that stable combustion of liquor was maintained and would possibly be the most acceptable disposal method for paper mill operators, thereby eliminating the dumping of waste sulfite liquor into waterways.

Waste sulfite liquor was preheated by steam coil in bottom of storage barrel while combustion occurred in an uncooled refractory-lined furnace that had been preheated. The outlet end of cylindrical furnace was partially closed with firebrick and a sheet metal plate connected to inlet end. An oil burner was attached to this steel plate. A steam-atomizing oil burner nozzle was installed for firing sulfite liquor. Instead of steam, compressed air was utilized as atomizing medium. Centrifugal blower supplied combustion air.

Furnace operating procedure consisted of oil-fired preheating for approximately one hour followed by cutting in the sulfite liquor burner. It was soon discovered that oil firing was not required for pilot ignition and combustion could be continued with sulfite liquor alone.

Preliminary investigation was not intended to yield accurate evaluation of combustion performance. With a concentration of liquor of 55% solids, combustion efficiency was only 76% — indicating incomplete combustion. Combustible material found in flue dust substantiated the premise. Design corrections of firing equipment would seem to be most feasible solution. This would attempt to eliminate heat loss from uninsulated sections and produce a short, intense, turbulent flame.

(Summary of information received from American Society of Mechanical Engineers, Engineering Societies Bldg., Dept. CP, 29 W. 39th St., New York, N.Y.)

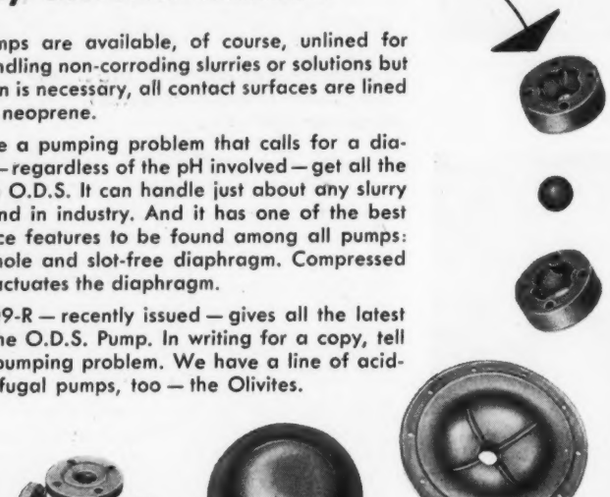
ODS Diaphragm SLURRY PUMP

Every Contact Inch Highly Corrosion Resistant

ODS Pumps are available, of course, unlined for handling non-corroding slurries or solutions but when protection is necessary, all contact surfaces are lined with rubber or neoprene.

So, if you have a pumping problem that calls for a diaphragm pump—regardless of the pH involved—get all the facts about the O.D.S. It can handle just about any slurry or solution found in industry. And it has one of the best low-maintenance features to be found among all pumps: a no-linkage, hole and slot-free diaphragm. Compressed air or vacuum actuates the diaphragm.

Our Bulletin 309-R—recently issued—gives all the latest details about the O.D.S. Pump. In writing for a copy, tell us about your pumping problem. We have a line of acid-handling centrifugal pumps, too—the Olivites.



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When inquiring check CP 2335 on handy form, pgs. 2-3

Assemble mobile stone crusher plant using only hand tools . . .

plant on wheels provides army with 50 tons per hour for military roads and runways

A mobile crushing and screening plant that can be assembled with hand tools, plant-mounted winches and rams, has been developed for use by the armed services on air fields and military roads.

Completely self-contained and with a capacity of 50 tons per hour, the crushing and screening plant requires no cranes or auxiliary cranes and jacks in its assembly or disassembly, although they may be used if available. All conveyors and auxiliary equipment needed are mounted on the main plant units. The plant is returned to traveling position with the same equipment and is then ready for moving to the next crushing and screening location.

(Information supplied by the Pioneer Engineering Works, Inc., Minneapolis, subsidiary of Poor and Company, Chicago, Ill.)

Catastrophies of acid spillage averted through use of plastic bottles . . .

flexible containers are non-breakable, stretch as contents freeze, and are much lighter than glass

A solution to the problem of protecting vitally-needed bulk quantities of poisonous or corrosive acids and caustic material from breakage while in transit has been found with the recent development of flexible polyethylene bottles.

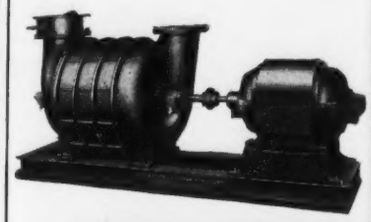
Featuring light weight in combination with unbreakability, the new containers will withstand the effect of sub-zero temperatures and high altitudes. If the contents should freeze, the walls of the polyethylene bottles will simply flex and expand but will not crack. This flexibility allows it to adjust to stresses imposed by unequal atmospheric pressures.

Not a bottle was broken

Blowmolded in one piece, the new carboy has passed the tests necessary for Bureau of Explosives recommendation for ICC approval to ship hydrofluoric acid and electrolyte sulfuric acid solution.

In capacities of 6½ and 13 gallons, the new carboy bottle has walls with 0.1 in thick. Filled samples have been dropped from various heights onto solid concrete without

AIR or GAS as you want it!



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Multi-Stage CENTRIFUGAL BLOWERS and EXHAUSTERS

for • AGITATION • AERATION • OXIDATION • COMBUSTION • GAS BOOSTING • FILTERING • CONVEYING

★ Clean, Dry Delivery at Uniform Pressure

★ H. P. Input Adjusts Automatically to Volume Handled

★ No Internal Moving Parts

★ Long Life with Maximum Efficiency and Minimum Maintenance

Our engineering staff will assist with your air or gas problems . . . compressed air costs very often can be materially reduced.

Write for Bulletin A-650

Air Appliance Division
U. S. HOFFMAN MACHINERY CORP.
113 FOURTH AVE., NEW YORK 3, N. Y.

When inquiring check CP 2336 on handy form, pgs. 2-3

for
NON-BLINDING ACTION...
longer screen life
use BEE-ZEE screens

Smooth, round surfaces of the exclusive BEE-ZEE ROUND ROD screens allows a faster, more positive screening action... eliminates screen clogging and blinding. That's because the fine point of contact between top and tie rods leaves no "pocket" where moisture or fine particles can collect.

BUILT-IN TENSION means LONGER LIFE
No stretching, no sagging because built-in tension is part of the design of all BEE-ZEE ROUND ROD SCREENS. All-welded, stainless steel construction resists rust and corrosion — is easy to keep clean.

WRITE FOR FREE LITERATURE

BIXBY-ZIMMER Engineering Co.
730 ABINGDON STREET, GALESBURG, ILLINOIS
BEE-ZEE SCREENS CAN BE FITTED TO ANY SCREENING EQUIPMENT

When inquiring check CP 2337 on handy form, pgs. 2-3

breakage or leakage at –10°F. In another test, the bottles were virtually undamaged after being struck with a truck moving at a speed of 50 mph. In a third test, 13-gallon bottles of the material were run over by a 10-ton bulldozer with steel treads. Although squeezed out of shape, bottles were not punctured and resumed their original shape after a "rest" period.

Each bottle has a heavy-wall molded polyethylene screw cap with a separate special inner polyethylene liner. A dome-shaped phenolic outer screw cap is provided to protect the neck against puncture by sharp objects.

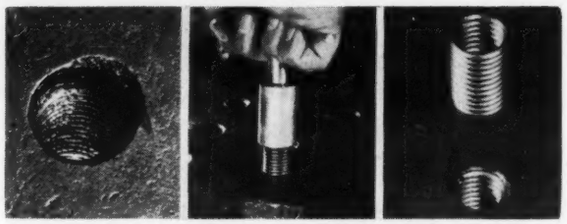
Bottles are used in special plywood-jacketed carboy containers that have withstood approximately 10,000 lb of sidewall compression testing without failure. Tare weight of the 13-gallon unit is approximately 29 lb, while the 6½ gallon unit weighs about 17 lb.

(Information supplied by Plax Corporation, Dept. CP, Hartford, Conn. . . . or for more information check CP 2338 on handy form, pages 2 and 3.)

Helical-wire thread inserts reduce down time and maintenance costs . . .

provide higher loading strengths and are more resistant to wear and corrosion than original threads

Time and cost savings of up to 80% have been reported in use of stainless steel helical-wire thread inserts as compared with other methods of restoring stripped or worn



After worn thread, left, is cleaned out and re-tapped, the helical wire is quickly and easily installed with an inserting tool. Reconditioned hole appears on right with helical-wire thread insert standing beside it

tapped threads. In addition, these inserts are stated to provide higher loading strengths and are more resistant to wear and corrosion than original threads.

In comparison with conventional thread repair operations, the wire-insert operation requires only: cleaning out of damaged thread, re-tapping of hole, and placing of wire-insert in the re-threaded hole. Because they are slightly larger than hole in which they are inserted, the wires are self locking. It is reported that no amount of vibration or bolt tightening will loosen them.

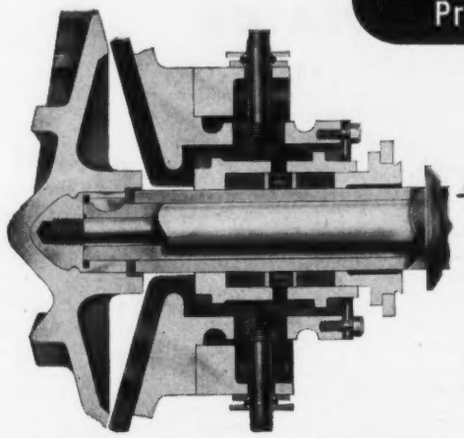
Inserts are available in following thread classifications: 4-40 to 1½-6 sizes in National and Unified Coarse; 6-40 to 1½-12 in National and Unified Fine; and ⅛-27 to 1-11½ in the pipe thread series. These inserts are supplied in 1, 1½ and 2-diameter lengths.

(Courtesy of Heli-Coil Corp., Dept. CP, 1184 Shelter Rock Lane, Danbury, Conn.)

Published above is a "corrected" version of an article which we ran on p 86 of April CHEMICAL PROCESSING. We erroneously reported product to be "not more resistant to wear . . ."—our apologies.

OLIVITE
Acid-Handling
PUMP

How It Answers the Problem of Leakage



Illustrated is the stuffing bo assembly of the Olivite Acid Handling Pump.

Since pump leakage is probabl the Number 1 Enemy when ha dling corroding solutions, no how in the Olivite Pump, extr precautions are taken to pr vent leakage:

1. The stuffing box floats on two rubber rings which permits shaft and packing movement. The packing is not crushed nor is the replaceable shaft sleeve scored.
2. The lantern ring permits circulation of the lubricant, water, solution, or grease.
3. The resilient packing is of acid-resisting material styled for long life.
4. Simple spring loaded wing nut adjustment permits application of correct and proper pressure by the yoke on the gland and packing. No "monkey" wrench required.

Thousands of Olivite Acid-Resisting pumps have been supplie the Process Industries during the past 20 odd years. The values c these years of design, manufacturing and operating experienc are embodied in every 1¼", 2" or 4" Olivite Pump you purchase Bulletin 308-R provides full details. When writing us please ou line your pumping problems.

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When inquiring check CP 2339 on handy form, pgs. 2-3

ACCURATE

Low Cost Temperature Control for Jacket Water and Lube Oil

POWERS

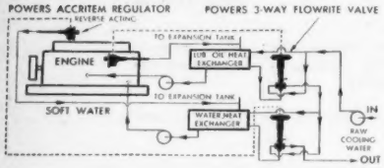
Compressed Air or Water Operated

ACCRITEM REGULATOR

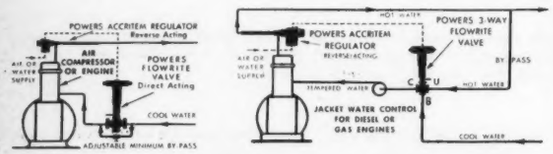
Unsurpassed for reliability and power to operate large or small size 3-way or 2-way diaphragm valves for accurate control of jacket water and lube oil cooling temperatures.

IMPORTANT ADVANTAGES

- ***Adjustable Sensitivity*** and over-heat protection.
- ***Calibrated Dial*** temperature adjustment.
- ***Simple, Rugged Construction*** withstands vibration and insures many years of reliable service.
- ***Temperature Ranges*** 50 to 250° F. and 150 to 350° F.
- ***Easy to Install.*** Requires 15 lb. supply of compressed air or water for its operation.
- ***Small Size*** — regulator head is only 2⅞" x 3⅝", sensitive bulb is 12" long with ½" I.P.S. connection.



Only a few of many possible applications



POWERS FLOWRITE DIAPHRAGM VALVES controlled by Powers ACCRITEM Regulators provide an unbeatable combination for better control and lower maintenance.

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3409 Oakton Street, Skokie, Illinois • Offices in Over 50 Cities

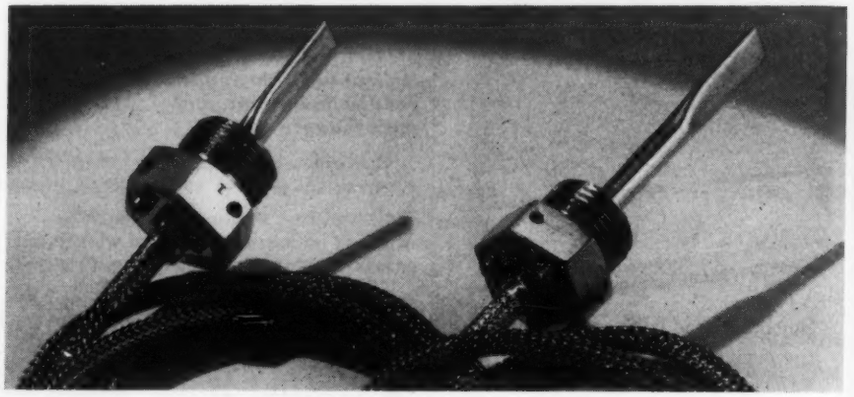
60 YEARS OF WATER TEMPERATURE CONTROL

When inquiring check CP 2340 on handy form, pgs. 2-3

Accuracy and Swift Response Characterize Resistance Thermometer

63% of temperature change in water is sensed in first second; accuracy is plus or minus 1%

ONE of the features of the Type 21 temperature sensing elements is their relatively high output of 0 to 1 volt. Another important fact is that the thermal time constant of the device is less than one second in water. When temperature changes, pickup will report 63% of the change in the first second.



Stainless or Inconel tips contain platinum resistance element

Pickup case consists of a tube flattened on the end and mounted in hexagonal nut assembly. Sensing element is a platinum resistance grid imbedded in ceramic insulation. Tube is usually two inches long and grid is about ¾ of an inch from the tip. For satisfactory performance, tube should be immersed one inch.

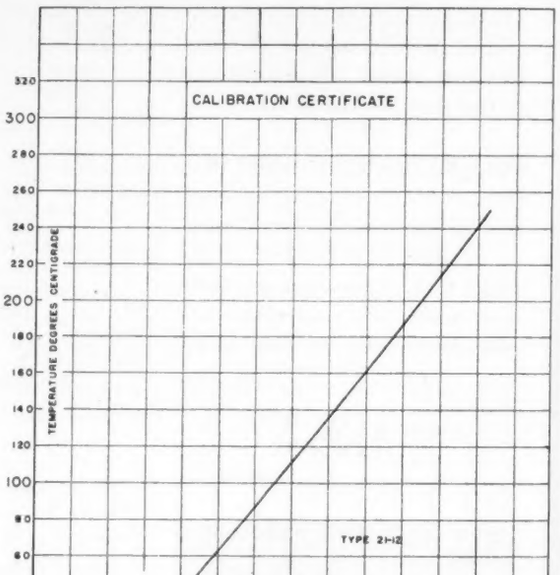
Output of the element is lineal, reaching one volt at the specified limit of its temperature band. Several ranges are available from 32 to 1832°F. Range designation, however, only means that the resistance is so chosen that its change will be fifty ohms in the specified temperature interval. Elements can be used satisfactorily at temperatures as low as minus 321°F (liquid nitrogen). Extreme upper limit information is furnished with each instrument as is a calibration certificate. Ordinarily, accuracy is plus or minus one per cent over the entire range, but higher accuracy units can be furnished.

Application of the device at pressures of 3000 psi is possible. Allowances must be made for stresses at high temperatures and pressures — manufacturer recommends that specific application be referred to him.

Construction materials include 18-8 stainless or Inconel for the tip, depending on temperature range. Tips can also be made in 316 stainless for corrosive conditions. Platinum resistor is supported on ceramic and has constantan lead wires.

Wheatstone bridge circuits are normally used with the sensing element and 20 milliamperes AC or DC are sufficient to excite the element for this service. By keeping the resistance in series with the element at a high value, relative to the element itself, current is almost constant and output is lineal.

(Developed by Trans-Sonics, Inc., Dept. CP, Bedford Airport, Bedford, Mass. . . . or for more information check CP 2341 on handy form, pages 2 and 3.)



Features simple operation and a wide selection of ranges . . .

improved oxygen indicator is available with ranges from 1 to 25% and is accurate to 2% of full scale

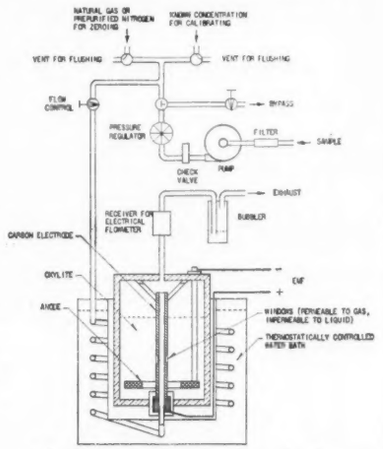
Manufacturer's previous model oxygen indicator found many uses in industry — among them: measuring oxygen content of combustible mixtures and inert atmospheres, in fuels and flue gases, and in gas mixtures to be piped. Type C-2 Oxygen Indicator has been redesigned for simpler maintenance and operation. Only three parts of the C-2 require attention in routine operation. These

Oxygen indicator is shown at right

are the carbon electrode which must be replaced periodically, the detector cell which requires about one ounce of electrolyte ("Oxylite") every two weeks, and the battery — a #2 dry cell — which must be replaced about once a week. Indicator is available in the following standard ranges: 0 to 1, 0 to 5, 0 to 10, and 0 to 25% oxygen. Accuracy in each case is two percent of the full scale value. Since the meter has fifty divisions, accurate readings can be made.

Detector cell consists of a metallic electrode and a hollow carbon electrode immersed in electrolyte. This cell is held at constant temperature by a thermostatically controlled water jacket. Cell is designed to operate in a highly polarized condition. When the sample gas is passed through its hollow carbon electrode, oxygen diffuses to the electrode surface and depolarizes the cell. Current, then, depends on the amount of oxygen able to get to polarized surface and hence on the amount of oxygen in the sample.

Instrument is frequently used with a recorder and both can be housed in the same cabinet and powered from the same 110v 60 cps source.



Schematic shows flow through the instrument

(Developed by Mine Safety Appliances Company, Dept. CP, Braddock, Thomas and Meade Sts., Pittsburgh 8, Pa. . . . or for more information check CP 2342 on handy form, pages 2 and 3.)

Every instrument man will find these catalogs invaluable . . . packed with facts on thermocouples, wells, tubes, thermocouple and extension wire, and prices. Send for your copies today.

W. J. KIRBY, Honeywell Supplies Man in the Los Angeles area, helps Mr. F. P. Edmonds of Lever Bros. Co. to select the correct precision-made thermocouple well from the wide selection covered in the Honeywell catalog—as part of the thorough, individualized service provided by the HSM plan.

Complete application and pricing information on all products, personal cooperation in establishing your own plant's requirements . . . these are but two of the ways that this plan can bring new convenience and economy to your pyrometer supplies purchasing.

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BROWN INSTRUMENTS

First in Controls

● *Important Reference Data*

Write for Catalog 200-2 on Thermocouple Wells . . . and for new Pyrometer Supplies Buyers' Guide No. 100-4

When inquiring check CP 2343 on handy form, pgs. 2-3

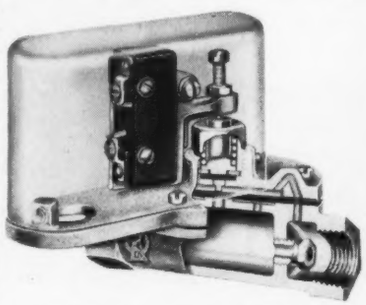
Sounds warning for faulty flow of water, air, or light oil . . .

interlock can stop equipment or sound warning when efficient flow rate deviates

Uses: Protection of fluid-cooled equipment such as air compressors, condensers, humidifiers, welding machines, and control units such as tubes and transformers. Other applications relate to maintaining the coolant supply to bearings and electrically operated garbage disposal units.

Features: Automatic interlock operates electrical control switch when flow of water, air, or light oil in supply lines deviates from efficiency requirements. Switch may be connected to prevent use of equipment or sound warning alarm signal.

Description: Interlock is made in two types. One model stops operation when flow rate falls below required, predetermined minimum. Other model stops equipment when rate of flow exceeds a given maximum. Electric switch on interlock makes or breaks contact in accordance with movement of lever arm and plunger that transmits the diaphragm action to the switch. Protective strainer is not required for efficient operation.



Makes or breaks contact according to lever arm movement

(Product of Hays Manufacturing Company, Dept. CP, Erie, Pennsylvania . . . or for more information check CP 2344 on handy form, pages 2 and 3.)

Indicates moisture content and eliminates lag in feed change . . .

meter measures dielectric constant of material while controller alters machine feed

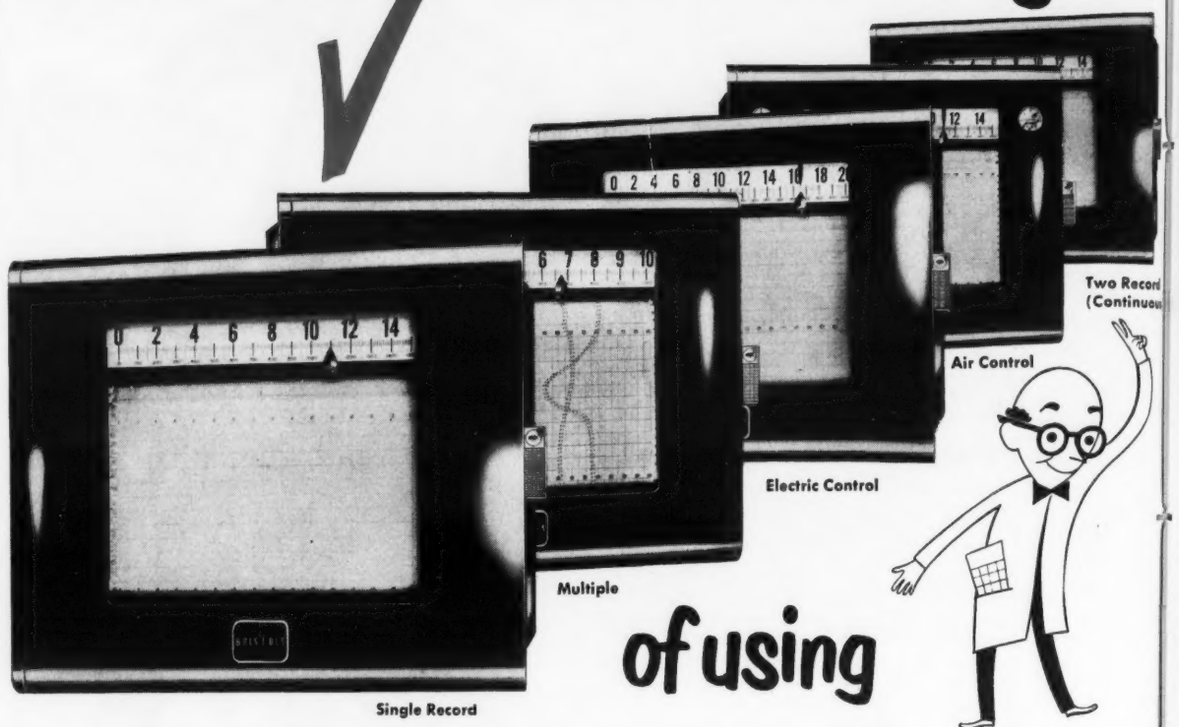
Uses: Determining and controlling moisture content in fabric drying and warp sizing machines.

Features: No electrical contact with material is required and finished product always has same moisture content. Lag in correction of machine feed is eliminated as controller regulates speed in relation to deviations from desired moisture content.

Description: Meter is based on principle that the dielectric constant of water is very high compared to that of cellulose. Material is passed between two plates arranged to form electrical condenser, and capacitance of condenser varies in accordance with water present. Sensitive bridge relays changes to meter which records moisture content.

ARC-1 controller receives impulses from meter and drying machine. Controller integrates these two voltages and control point may be set by index pointer on recorder. Push buttons provide for alternation of manual or automatic control. Pilot lights indicate variations in moisture content and corrections being made in machine speed. Machine ignores sewings and damp spots, and can be adjusted to meet requirements of drying or warp

CHECK the Advantages



of using the Dynamaster Family

of continuous-balance electronic instruments

Strip chart or circular chart recorders . . . recorders with slow or fast pen speeds and chart speeds . . . single or multiple recorders . . . automatic controllers . . . all in the same case with identical components except the chart-drive mechanisms.

This variety-with-standardization assures you of easier installation, better looking control panels, simpler maintenance. The service man who knows one Dynamaster, knows them all.

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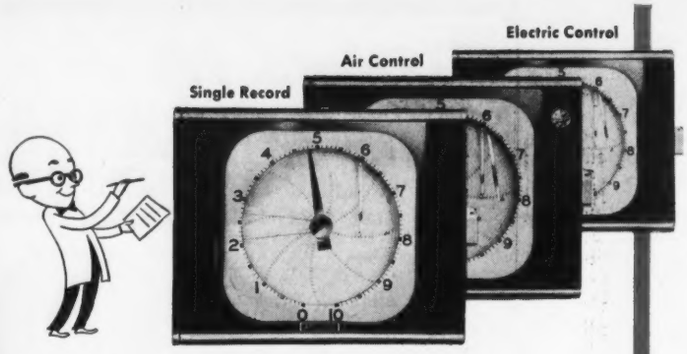
AUTOMATIC CONTROLLING, RECORDING AND TELEMETERING INSTRUMENTS



"Everyone who sees these Dynamasters is impressed with clean simplicity of internal design."

You'll be impressed too

WITH FEATURES LIKE THESE:

- Models to measure any variable convertible into d-c voltage, d-c current, resistance, capacitance
- Continuous-balancing electronic circuit assures instant response
- All types of electric and air-operated controllers offered
- Little or no maintenance
- All models use the same easy-to-replace components
- Electronic unit uses vacuum tubes available at any radio supply house
- Full-scale pen travel of 7, 3 or ⅔ seconds
- Chart speeds from ¾ in. per hour to 7200 in. per hour.
- Multiple recorders up to 16 points
- Practically immune to vibration, shock, or external stray currents

YOU'LL WANT TO GET *full details by using the coupon to order Catalog No. P1245.*

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North American Cyanamid Limited
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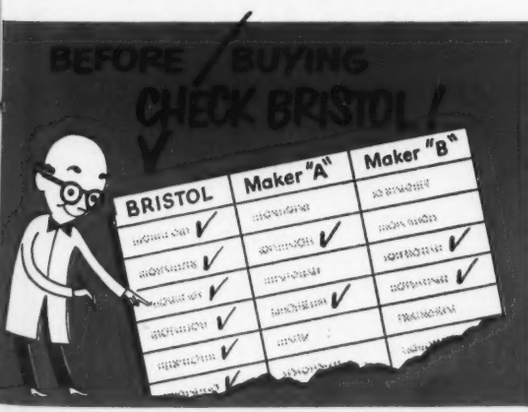

THE BRISTOL COMPANY
141 Bristol Road
Waterbury 20, Conn.

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COMPANY _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

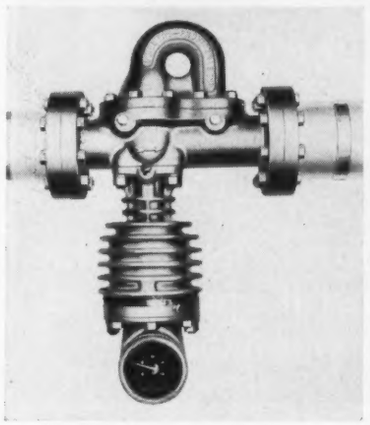
When inquiring check CP 2345 on handy form, pgs. 2-3

sizing machine. Controller does not operate until moisture content deviates beyond tolerance limits.

(Product of Fielden Instrument Corporation, Dept. CP, 2920 N. Fourth St., Philadelphia 33, Pa. . . . or for more information check CP 2346 on handy form, pages 2 & 3.)

Redesign and stronger shaft make gas-and-steam meter stand liquid slugs . . .

streamlining, Meehanite body, and simplified rotor mechanism also add to revised design



Body is now cast in Meehanite

Uses: For metering steam, air, or gases.

Features: Redesigned for strength and longer life.

Description: Model SMKS Shuntflo Meter has been redesigned and has now incorporated these changes: 1) streamline damping chamber to facilitate a more uniform cooling, 2) all Meehanite body casting, 3) simplified rotor mechanism reported to be more efficient, longer-lasting, easier to repair or replace, and 4) a strengthened rotor shaft designed to withstand slugs of condensate or other liquid, or sudden changes in pressure.

(Shuntflo Meters are made by Builders-Providence, Inc., Dept. CP, 345 Harris Ave., Providence 1, R. I. . . . or for more information check CP 2347 on handy form, pages 2 and 3.)

Six-inch dial and movement serves to measure temp, pressure of load . . .

stainless steel Bourdon movement is designed to eliminate linkage errors

Uses: General dial indicator for pressure, temperature, or loads through a Bourdon movement.

Features: Stainless steel movement is designed to eliminate linkage errors.

Description: Six-inch Dial Indicator is designed for flush or face mounting individually or in a panel. Die-cast aluminum case permits bottom or back connection. Dial background is black with white graduations, numbers, and pointer. Micro-adjustment of the pointer allows very close setting of zero.

For temperature applications, four types are available: mercury, vapor, gas, or organic liquid. Ranges extend from minus 100 to 1200°F.

Pressure applications cover range from 12 to 20,000 psi. Load applications make use of 0 to 75,000 pounds.

(These instruments are produced by Taylor Instrument Companies, Dept. CP, Rochester 1, N. Y. . . . or for more information check CP 2348 on handy form, pages 2 and 3.)

Most comprehensive guide to thermostat applications ever published!

Get your copy of unusual 52-page catalog today!

Find out *now* how you can get closer temperature control at lower cost. Illustrated, 52-page catalog shows you:

WHY Fenwal THERMOSWITCH® thermostats respond at the preset temperature you want (between —100°F and +1500°F) within the desired operating differential (can approach 0.1°F in a well-designed system).

HOW to choose the right THERMOSWITCH unit from the ten standard types for controlling temperatures of solids, liquids or gases.

WHERE to apply THERMOSWITCH controls in relation to heating elements in ovens, incubators, stills, dryers and other equipment.

WHEN special modifications may be added to standard THERMOSWITCH units to fit specific conditions.

HOW MUCH standard THERMOSWITCH thermostats and special modifications cost. You'll be surprised at the low list prices.

SEND FOR YOUR FREE COPY of this Fenwal catalog (No. 400) today. Fenwal, Incorporated,245Pleasant St., Ashland, Mass.

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THERMOSWITCH®

Electric Temperature Control and Detection Devices

SENSITIVE...*but only to heat*

When inquiring check CP 2349 on handy form, pgs. 2-3

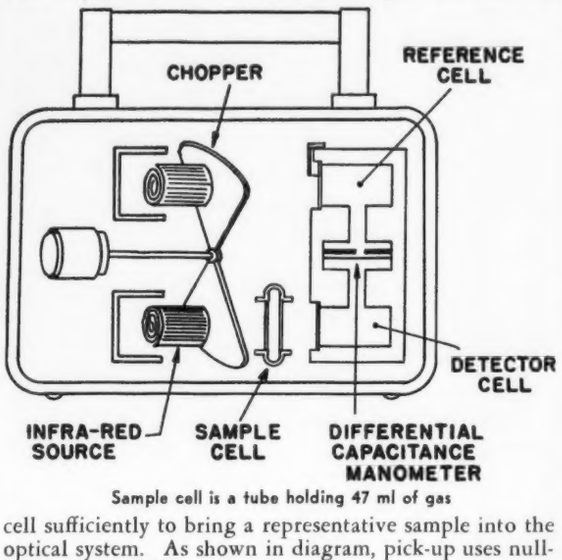
PROCESS INSTRUMENTATION

Attains 90% response to CO_2 in about 1/3 second with recorder . . .

although designed for medical use, analyzer is sensitive to CO_2, unaffected by most other gases

Compact CO_2 Analyzer is built in two sections. Pick-up unit is only 6 x 4½ x 8 inches and is explosion-proof. Standard units are designed for a full-scale reading of 15% carbon dioxide, though gain may be adjusted so that full scale readings of 5% can be made. Normally an accuracy of 0.2% CO_2 is attained, but frequent calibration and careful technique can bring this value to 0.1% CO_2.

Absorption cell consists of a ¾-inch ID tube eight inches long. Total volume of the cell is 47 cubic centimeters, but only 30 cubic centimeters of sample will flush the



Sample cell is a tube holding 47 ml of gas

cell sufficiently to bring a representative sample into the optical system. As shown in diagram, pick-up uses null-balance principle.

Despite its good sensitivity to carbon dioxide, unit's response to other gases normally found in the atmosphere — or to nitrous oxide, ethyl ether, cyclopropane, and water vapor — is less than one per cent of the scale.

Electronic amplifier section is 15 x 10 x 8 inches, will supply up to 5 ma to a 500-ohm input recorder. Response time at the recorder is 90% in 1/3 second.

(Developed by Liston-Becker Instrument Co., Inc., Dept. CP, Stamford, Conn. . . . or for more information check CP 2350 on handy form, pages 2 and 3.)

Temperature creep is soon detected in tests for choosing metals of high stress quality . . .

twenty machines are used to evaluate materials for steam or gas turbines, jet engines

In one of the newest laboratories in the United States devoted to the study of high temperature creep in highly stressed metals, more than 20 creep machines guide the selection of materials for the stressed parts of steam or gas turbines and jet engines.

Two types of tests are employed in evaluating the creep characteristics of these materials. One is a short time test at relatively high temperatures, loads and deformations (1% in 100 hr) on jet engine materials that have

Depend on AUTO-LITE

FOR TEMPERATURE INDICATION

Model G Thermometer (one-to-one ratio, liquid filled type) Priced from $18.

Model V Thermometer (vapor pressure type) Priced from $10.25.

Auto-Lite Indicating Thermometers are available in many types and sizes, with a choice of temperature ranges and mountings to meet your needs. Send for catalog.

THE ELECTRIC AUTO-LITE COMPANY
INSTRUMENT AND GAUGE DIVISION • TOLEDO 1, OHIO
NEW YORK CHICAGO SARNIA, ONTARIO

AUTO-LITE
INDICATING & RECORDING THERMOMETERS

When inquiring check CP 2351 on handy form, pgs. 2-3

BUILDERS

BUILDERS-PROVIDENCE

NEED RECORDING, INDICATING, CONTROLLING INSTRUMENTS ?

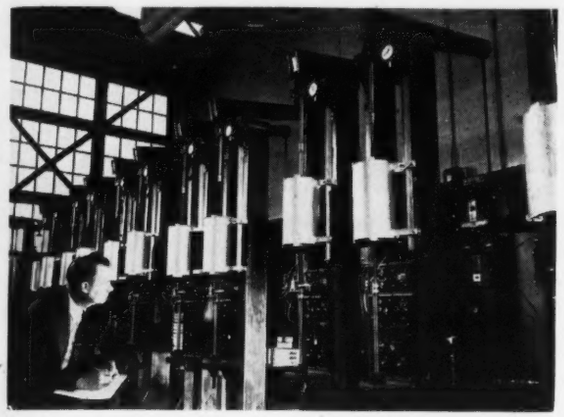
For full information on BUILDERS EQUIPMENT for metering and controlling flow of liquids, steam, or dry materials, write Builders-Providence, Inc. (Division of Builders Iron Foundry), 458 Harris Ave., Providence 1, Rhode Island.

BUILDERS-PROVIDENCE

When inquiring check CP 2352 on handy form, pgs. 2-3

a life requirement as low as 300 hours. The other is for materials utilized in steam turbines which must have a life of 20 years or more at lower temperatures and loads. Specimens for all tests are 0.505-inch diameter test bars.

For tests of jet engine materials, usually precision cast, five automatically recording, screw-type creep machines are utilized. Temperatures from 1200 to 1600°F are



recorded and automatically controlled within close limits by means of three thermocouples on each specimen and by three separate electric heating elements in the furnace surrounding each specimen.

Twelve lever-type creep machines are used for most of the creep tests of steam turbines and gas turbine materials that are subjected to elevated temperatures. These are usually forgings, and in many instances the specimens may be cut out of actual parts, such as turbine blades. Test periods range from 1000 to 22,000 hr (2½ yr) at temperatures of 800 to 1200°F. These temperatures are automatically controlled also by means of three thermocouples and three-element furnaces.

In addition to conventional creep tests, bolt materials are subjected to relaxation tests at high temperatures. The relaxation machine shows the rate at which bolt materials may lose initially imposed loads when held under constant strain at elevated temperatures.

(Information supplied by Baldwin-Lima-Hamilton Corp., Dept. CP, Philadelphia 42, Pa.)

Electronic control gives time-rated acceleration and deceleration

Two-page bulletin describes electronic motor-drive accessory that provides time-rated acceleration and deceleration. Specialized functions of unit are shown in photographs of textile slasher drive and turrent lathe. Bulletin states that electronic control provides automatic speed changing, pre-set speed selection, and improved speed regulation for adjustable voltage drives. Adjustment of acceleration and deceleration is normally available between limits of 1½ and 25 sec, but wider ranges can be provided.

Independently adjustable acceleration and deceleration is provided through use of two rheostats. Starting and stopping rates are uniform throughout the entire range. Time required to change from high speed to low speed is determined by setting these rheostats. Bul K-2025 is issued by Reliance Electric & Engineering Co., Dept. CP, 1076 Ivanhoe Rd., Cleveland 10, Ohio. When inquiring specify CP 2353 on handy form, pages 2 and 3.

In the laboratory — in the plant — BECKMAN pH CONTROL can be used in many valuable ways!

THE BECKMAN MODEL H-2 pH METER is one of a complete range of Beckman pH Meters available for every type of application*. The H-2 is particularly recommended for applications where high accuracy and simple operation—combined with the convenience and low cost of 115-v. AC operation—are desired.

It provides instant and direct pH readings, and a simple, built-in dial permits quick, convenient temperature compensation over the entire range of 0° to 100°C (32° to 212° F.). High reading accuracy is assured by wide-spread dual range scale that reads from 0 to 8 pH or from 6 to 14 pH at the turn of a switch. Same switch also provides instant millivolt readings from 0 to ±800 mv and from ±600 to ±1400 mv for titrations and oxidation-reduction measurements.

Built-in electrode support and compact case design save valuable space and permit easy portability to various plant locations.

Particularly important is the wide range of factory-sealed, maintenance-free Beckman Glass Electrodes available for use with this instrument . . . electrodes that are virtually unbreakable . . . that cover extreme temperature ranges from below freezing to above boiling . . . that have an unprecedented pH range with negligible errors . . . that are abrasion-resistant and chemically durable to a degree never before thought possible in glass electrodes.

***In addition to the H-2 Meter, other Beckman pH equipment includes completely automatic pH indication and control instruments for large-scale process applications . . . battery-operated models for complete portability in plant and field use . . . and a laboratory type instrument that features maximum versatility and accuracy for research and laboratory applications.**

In virtually all types of chemical laboratories—both in industry and science—Beckman pH instruments are playing an increasingly important role in simplifying operations, reducing processing costs, increasing uniformity and quality of the finished product.

Most laboratories are already familiar with the unique advantages of Beckman electrometric methods in making pH measurements . . . the far greater accuracy, speed and simplicity of making pH determinations without human errors in color judgment and free from the other inaccuracies and inconveniences of colorimetric methods. But many laboratories are not fully aware of the other useful ways Beckman pH Meters can be used in modern laboratory and industrial chemistry.

For example, Beckman pH instruments can also be used to obtain greater accuracy and convenience in various types of titrations and end-point determinations . . . they can be used for making a wide range of millivolt readings . . . and a varied selection of special-purpose Beckman electrodes permits many other types of electrochemical measurements to be made, quickly and accurately.

In fact, the great variety of Beckman Glass Electrodes—the most rugged, most advanced and most diversified in the industry—permits the utmost versatility in the application of Beckman pH Meters. These electrodes cover the complete temperature range from below freezing to above boiling, can be used at even high pH values with negligible sodium errors, are factory sealed (require no maintenance) and are unusually resistant to alkalis, acids and rough treatment.

Among the many Beckman pH Meters available, the Model H-2 Meter illustrated above is most popular for general use. A few of its many unique features are outlined at left. For further details on this and other Beckman instruments see your authorized Beckman dealer, or write direct.

BECKMAN INSTRUMENTS, INC.
South Pasadena 11, Calif.
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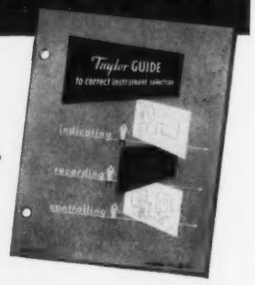
Send for free booklet "What Every Executive Should Know About pH." It's helpful and informative.

BECKMAN INSTRUMENTS control modern industries

Beckman Instruments: pH Meters and Electrodes — Spectrophotometers — Radioactivity Meters — Special Instruments

When inquiring check CP 2354 on handy form, pgs. 2-3

CAN'T FIND THE RIGHT INSTRUMENT?



You need this Taylor Guide

Here is a basic guide to all of Taylor's conventional instruments for indicating, recording and controlling almost any process variable: temperature, pressure, humidity, flow, liquid level, load, speed and density. A special section discusses special function instruments such as time-schedule, pneumatic set, etc.

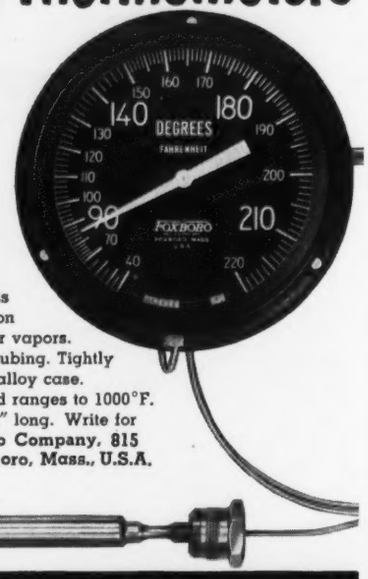
Keep it handy as a reference whenever you're considering instrumentation. Write for Bulletin 98170, Taylor Instrument Companies, Rochester, N. Y., or Toronto, Canada.

Instruments for indicating, recording and controlling temperature pressure, flow, liquid level, speed, density, load and humidity.

TAYLOR INSTRUMENTS MEAN ACCURACY FIRST

When inquiring check CP 2355 on handy form, pgs. 2-3

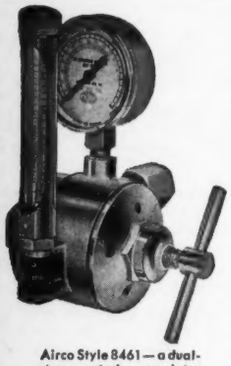
NEW "Lifetime" Dial Thermometers



You're *always* sure of accurate temperature readings with this new Foxboro "Lifetime" Dial Thermometer. Welded "one-piece" bulb and connecting capillary tubing of 316 Stainless Steel prevent corrosion from liquids, fumes or vapors. Needs no protective tubing. Tightly sealed 5" aluminum alloy case. Available in standard ranges to 1000°F. Easy-to-read scale 12" long. Write for details. The Foxboro Company, 815 Norfolk Street, Foxboro, Mass., U.S.A.

FOXBORO Reg. U.S. Pat. Off. DIAL THERMOMETERS

When inquiring check CP 2356 on handy form, pgs. 2-3



Airco Style 8461—a dual-stage metering regulator which indicates actual flow—ideal for laboratory analysis and industrial processing.

For top accuracy and dependability in regulating gases under pressure... SPECIFY AIRCO REGULATORS

OXYGEN
ACETYLENE
NITROGEN
HELIUM
ARGON
HYDROGEN
NATURAL GAS
PROPANE

Airco pressure regulators are engineered for all operations involving the use of compressed gases ...for maintaining precise gas flows and pressures in laboratory operations where accurate control and uniformity is a "must".

For these, and all other compressed gas requirements, Airco has the most complete line of dependable regulators available today—for dual or single stage, high or low pressure regulation in cylinders or through manifolds and pipe lines. In design, materials and workmanship, Airco regulators conform to the same high standards which have characterized all Airco products for decades.

For more information about the entire line of Airco pressure regulators, write for Airco Catalog 5. Everyone concerned with regulating gases under pressure will find this booklet invaluable. It gives a quick "reason why" one type of regulator or another will provide desired uniform pressures, at less cost, for a particular job—saving time, effort and needless waste of money. Write now to your nearest Airco office for a copy.

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REPRESENTED INTERNATIONALLY BY AIRCO COMPANY INTERNATIONAL
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Offices in Principal Cities

When inquiring check CP 2357 on handy form, pgs. 2-3

Programs heating, cooling cycles with twenty-three set rates or external signal . . .

strip chart instrument is available with on-off or proportional control, single or multiple record

Electronic strip chart recording and indicating program controller is supplied for actuation by thermocouple, resistance thermometer, DC millivoltage, or by manufacturer's radiation pyrometer. A variety of control forms, both contact and proportional types are available in single record and multiple record models.

In order to obtain flexibility, the controller has separate upscale and downscale set point index drives. Twenty-three basic index drive speeds are available. And for rates of temperature change different from any of these, externally mounted rate controllers can be supplied.

Included in the programming mechanism, in addition to the index drive motors, are index-operated, pen-operated, and differential-operated switches. A maximum of three index-operated switches can be obtained for operating rate controllers, for initiating holding periods, or for signals. One pen-operated switch can also be furnished.

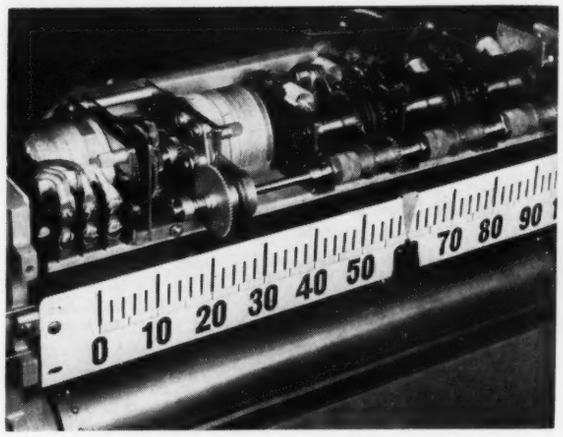


Photo shows components of the program controller

Differential switch is useful for limiting the differential between set point and value of the variable if the process under control should fail to cool as rapidly as demanded by the rate of index travel. It can be used to actuate cooling blowers when the differential becomes too great.

(This instrument is now stocked by Brown Instrument Div., Minneapolis-Honeywell Regulator Co., Dept. CP, Wayne & Windrim Aves., Philadelphia 44, Pa. . . . or for more information check CP 2358 on handy form, pages 2 and 3.)

Previews plastic materials for electronics production

Four-page folder outlines embedments, glass-resin laminates, and other plastic materials designed to meet construction requirements in electronics. Hermetic sealing, bare point-to-point wiring, and low dissipation factors are among the advantages credited to plastic embedment. Two-color folder offers pictorial review of electronic equipment utilizing plastic materials. Illustrated items include transformers, thermister assemblies, oscillators, and embedded helical antenae.

Folder cites polystyrene and polyethylene castings to meet design requirements in high-frequency transmission sys-

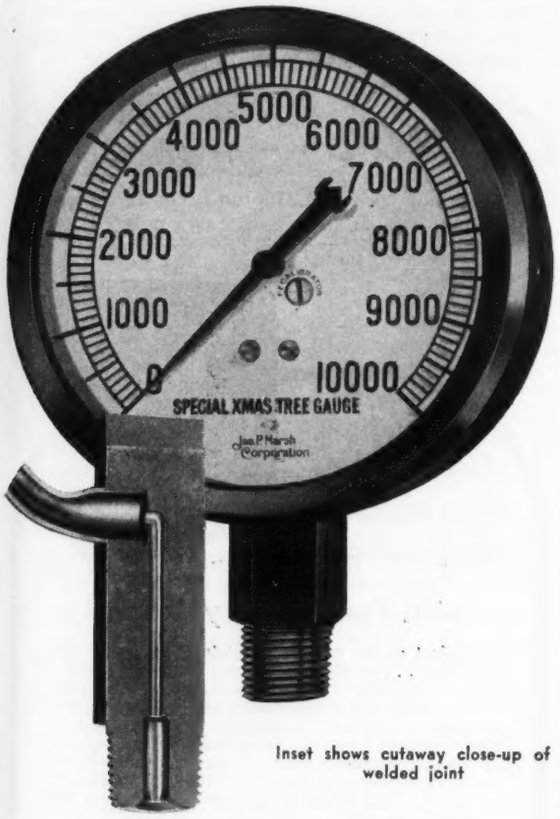
tems. Plastic materials are available with dielectric constants of specified values up to 25. Conductive plastics are also available to meet needs in variable resistor design. Folder "Plastics for Electronics" is issued by Emerson & Cuming Company, Dept. CP, 126 Massachusetts Ave., Boston 15, Mass. When inquiring specify CP 2359 on handy form, pages 2 and 3.

Bourdon movement welded-in to prevent leaks at 10,000 psi . . .

seven ranges for high pressure work are all accurate to within plus or minus ½ percent

Several features of this high-pressure Xmas Tree Gage make it particularly well suited for general use. Seven ranges of the gage are one, two, three, five, six, eight, and ten thousand pounds per square inch. Accuracy on any range is guaranteed to be plus or minus one-half-percent.

Interesting feature of the gage is the welded construction which joins the Bourdon tube to the gage inlet. "Cono-welded" is the name chosen to represent this construction.



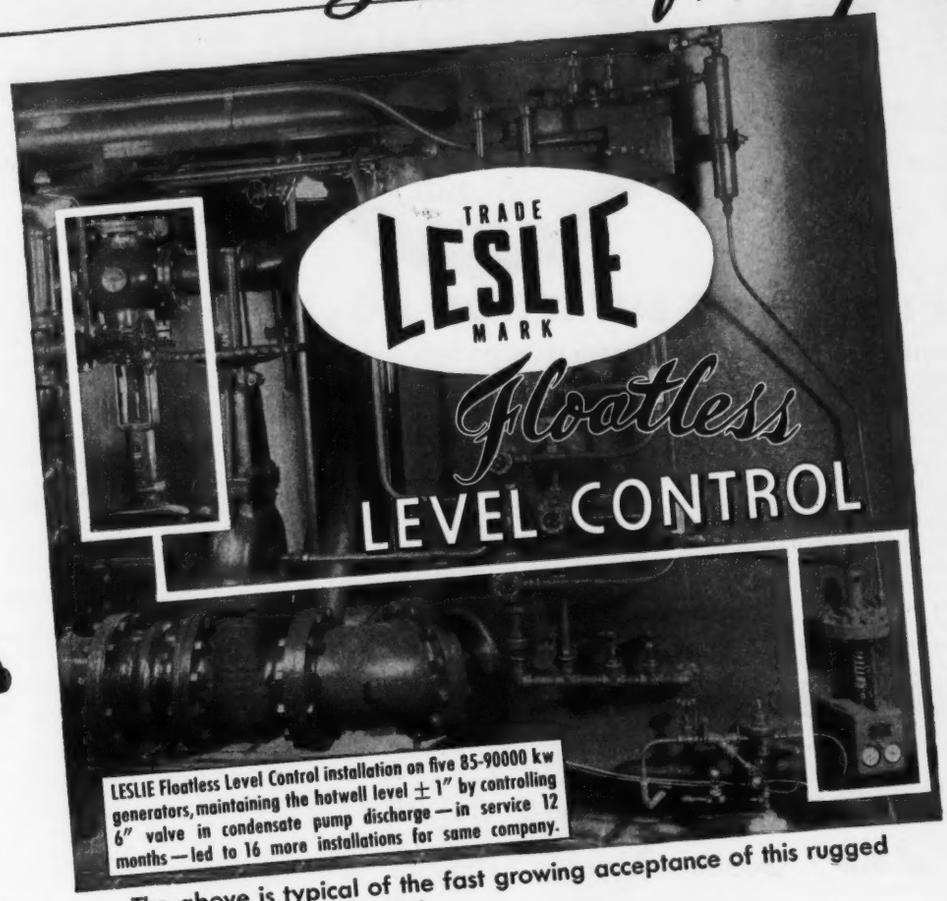
Inset shows cutaway close-up of welded joint

Photo-micrographs show that metal in the area of the weld has a strong, reliable structure. This method of joining prevents leaks even at top pressures of 10,000 psi.

Dial case of the gage is available in either a 4½ or 6-inch diameter. Made of wrought steel of boiler-plate thickness, the case is copper-clad inside and out. Final finish is a black enamel. Case is equipped with safety blow-out plug.

(Product of Marsh Instrument Co., Dept. CP, Skokie, Ill. . . . or for more information check CP 2360 on handy form, pages 2 and 3.)

An Outstanding Record of Acceptance!



LESLIE Floatless Level Control installation on five 85-90000 kw generators, maintaining the hotwell level ± 1" by controlling 6" valve in condensate pump discharge — in service 12 months — led to 16 more installations for same company.

The above is typical of the fast growing acceptance of this rugged and accurate level control.

ADVANTAGES

- EASY TO INSTALL
- ACCURATE REGULATION (± 1" Water Column)
- NO FLOATS, STUFFING BOXES, ETC.
- MULTI-MEDIUM ACTUATED
- DIAPHRAGM PRESSURE ELEMENT
- ACTION REVERSIBLE

Applications: On open and pressurized vessels, including boilers, tanks, evaporators, heaters, standpipes, etc.

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SEND for **illustrated Bulletin**

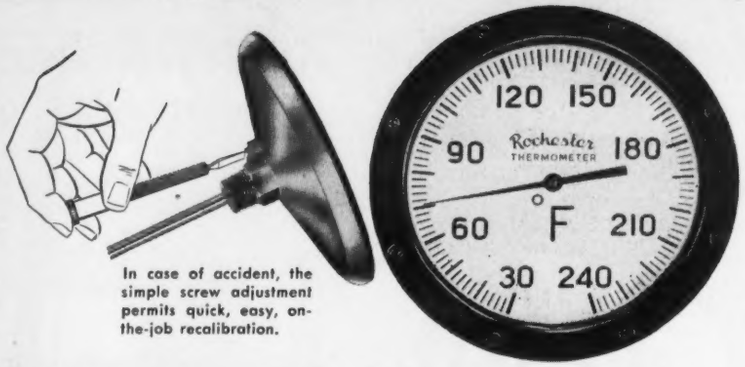
Look for LESLIE Regulators under "Valves" or "Regulators" in your Classified Telephone Directory in leading industrial cities where LESLIE factory-trained engineers are located.

LESLIE CO., 281 Grant Avenue, Lyndhurst, New Jersey

1827

PRESSURE REDUCING VALVES • PRESSURE CONTROLLERS • FLOATLESS LEVEL CONTROLS
PUMP GOVERNORS • TEMPERATURE REGULATORS
SELF CLEANING STRAINERS • AIR HORNS • STEAM WHISTLES

When inquiring check CP 2361 on handy form, pgs. 2-3



In case of accident, the simple screw adjustment permits quick, easy, on-the-job recalibration.

DON'T DROP IT! BUT IF YOU DO...

ROCHESTER DIAL THERMOMETERS are built to take severe blows without damage to their sensitive movements. But when hit hard enough to knock them out of adjustment, all you need is a screwdriver to put them right back on the job—as accurate as ever. This unique Rochester recalibration feature eliminates the danger of costly production errors due to inaccurate readings.

WELDED STAINLESS STEEL construction makes Rochester thermometers more durable, sensitive, pressure tight and resistant to corrosion than any before offered. Backed by 35 years of instrument making experience.

ORDER TODAY from your Rochester Representative, or write for further details. Rochester Manufacturing Co., Inc., 86 Rockwood Street, Rochester 10, N. Y.

Rochester Manufacturing Company, Inc.
86 Rockwood St., Rochester 10, N. Y.

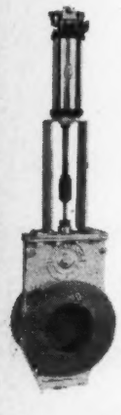
ROCHESTER DEPENDABLE ACCURACY GAUGES

DIAL THERMOMETERS GAUGES AMMETERS

When inquiring check CP 2362 on handy form, pgs. 2-3

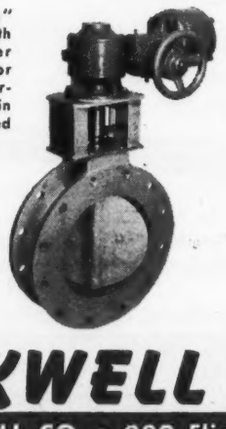
for Better Control and Shut-Off

of Air • Gases • Liquids • Solids



Better choose Rockwell Butterfly or Slide Valves. You get commercially tight shut-off in any metal construction; drip or air-tight in rubber-lined metal valves. You can have any manual or automatic control mechanism. Pipe size up to 72"—and larger. High or low pressure or temperature. Easy to install and service. Write for Catalog.

"Kwikleen" slide valve with air cylinder operator; for handling carbon shapes in a hopper feed system.



Butterfly valve with electric motor and declutching mechanism for emergency handwheel operation; for handling water at 25 p.s.i.

Stainless steel butterfly valve for welding into pipe line; with air diaphragm operator and valve positioner; operation at 1600° F.

ROCKWELL VALVES

W. S. ROCKWELL CO. • 220 Eliot St., Fairfield, Conn.

When inquiring check CP 2363 on handy form, pgs. 2-3

PROCESS INSTRUMENTATION

Translates air pressure into signal voltage at 400 cps . . .

models available respond to either static or differential pressure

Uses: Designed primarily for aircraft systems, these units have a potential value of changing pneumatic pressure to an easily-read 400 cps voltage.

Description: Transducers TR101 and TR102 are precision built 400 cps instruments which convert static and differential pressures, respectively, into electrical signals. Bourdon tube is the essential element. It is built of a zero thermoelastic material

Zero to one atmosphere; zero to three volts

to avoid changes due to ambient temperature shifts. In addition, there are thermostatically controlled heaters in the transducers to avoid wide swings in temperature. Design employs no bearing or sliding contacts.

Transducer is of the electromagnetic type comprising a variable reluctance magnetic pick-off bridge circuit and the cantilever suspended Bourdon tube.

Measuring 2½ x 2½ x 7¼ inches, the devices operate in the pressure range from zero to about atmospheric. Corresponding output runs from zero to three volts.

(Product of Servomechanisms, Inc., Dept. CP, Post and Stewart Aves., Westbury, Long Island, N. Y. . . . or for more information check CP 2364 on handy form, pages 2 and 3.)

Range and specs on test instruments

Four-page bulletin illustrates electronic instruments and panel meters. Over 20 models are illustrated and brief description accompanies each unit. Pertinent data such as range, line voltage, sensitivity, probe, etc are included. Featured item is 105-125v, 50-60 cps oscilloscope calibrator. Other units include vacuum tube voltmeter, tube testers, and microtesters.

Form 2052 is issued by Simpson Electric Company, Dept. CP, 5200 W. Kinzie Ave., Chicago 44, Ill. When inquiring specify CP 2365 on handy form, pages 2 and 3.

READ AIR VELOCITIES instantly... accurately... anywhere...

...WITH THE

ALNOR VELOMETER

Alnor Velometer, a precision-built, self-contained, portable instrument, gives you instant, *accurate* readings of air velocities anywhere—in plants, mines, mills or laboratories. Measures speed of air flow through ducts, grilles, furnaces, spray booths or in the open. This rugged instrument needs no special care or delicate handling—anyone can use it and get accurate readings. Needs no calculations or reference charts. Available in a wide variety of scale ranges, and with a full assortment of jets and fittings for every application. You'll want full details and prices, so write for Bulletin 2448-G, Illinois Testing Laboratories, Inc., Room 504, 420 No. La Salle St., Chicago 10, Ill.

Alnor PRECISION INSTRUMENTS FOR EVERY INDUSTRY

When inquiring check CP 2366 on handy form, pgs. 2-3

CHEMICAL WASHING TO KNOWN PURITY

with Conductivity Control

● Product quality can be maintained . . . water use minimized . . . by controlling wash water input with a Foxboro Dynalog* Conductivity Controller. Operating at 1000 cycles electrode current, this instrument holds polarization errors to an absolute minimum . . . combines laboratory precision and industrial ruggedness. Its capacity-bridge measuring system eliminates the usual slidewire, and provides STEPLESS continuous balancing. Unmatched in sensitivity, accuracy and speed of response!

Dynalog Controllers also provide precise control of *dilution* or *concentration* in liquid chemicals. Write for detailed information. **The Foxboro Company, 815 Norfolk Street, Foxboro, Mass., U.S.A.**

*Reg. U.S. Pat. Off.

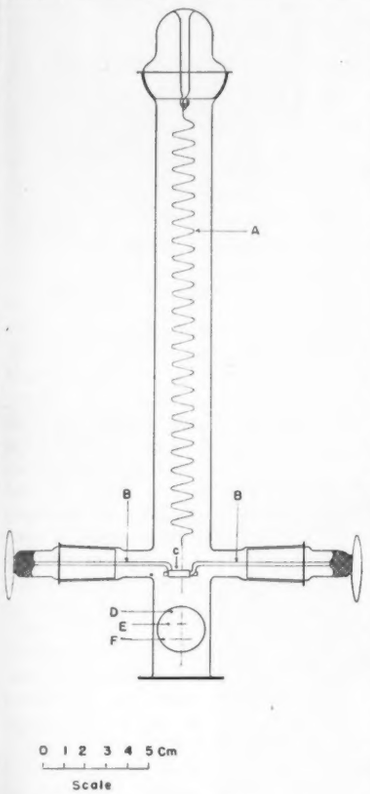
FOXBORO Reg. U.S. Pat. Off. Dynalog Control of Conductivity

When inquiring check CP 2367 on handy form, pgs. 2-3

Faster damping of tungsten spring balance speeds up weighing in vacua . . .

NBS-developed device is highly sensitive, but is easily built and inexpensive

A simple tungsten spring balance recently developed by Dr. S. L. Madorsky of the National Bureau of Standards has been found very convenient for accurate weighing of small quantities in a vacuum. The device is highly sensitive but quite inexpensive and easily constructed. Advantages over balances using a fused quartz spring are 1) comparative lack of fragility, and 2) much faster damping after disturbance in high vacuum — 10 to 15 minutes vs several hours.



The NBS balance consists of 23 turns of 3-mil tungsten wire (A in drawing), each turn having diameter of about 1.1 centimeters. The spring is enclosed in evacuated Pyrex tube and is suspended from a Pyrex rod attached to a ball joint at top of tube (for centering spring in tube). Material to be weighed is supported in a platinum crucible, weighing about 200 mg, which is attached to lower extension of the spring. Total weight of spring and extension down to crucible is about 100 mg.

A sensitive comparator, reading to 1 micron, is used to observe the change in position of a crossline (E), attached to the spring extension, with respect to a thin horizontal wire (F) attached to flat glass window (D) in the glass tube housing the balance. This wire serves as the zero point. Sensitivity of the balance is about 525 microns per mg.

To minimize the effect of elastic creep when the spring is not in use and to avoid disturbance of the spring when the crucible is removed for charging, the balance is provided with a pair of rubber friction clasps (C). The clasps are attached to brass rods (B) held rigidly in ground joints by Apiezon wax. They are manually rotated in opposite directions until they grip the extension of the spring.

The balance is operated in a temperature controlled room to minimize the errors which might occur because of change in modulus of rigidity of tungsten with temperature.

(Information courtesy of National Bureau of Standards, U.S. Department of Commerce, Washington 25, D.C.)

Looks like we're using

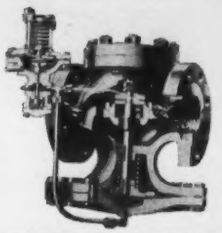
SPENCE REGULATORS

all over our plant

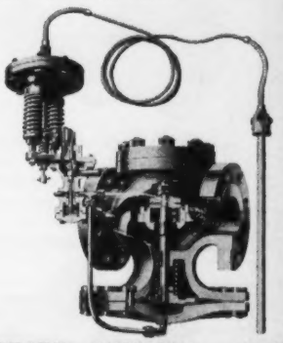
This busy plant has ordered and re-ordered Spence Regulators for two good reasons. (1) Spence offers a *wide-range line* to handle a host of regulating jobs. (2) What's more, Spence units give accurate service year after year. Maintenance is negligible. Over-all costs are low. These design features explain why . . .

- **Single Seat Packless Construction**
- **Large Balanced Metal Diaphragm**
- **Sensitive Pilots**
- **SECO Metal Seats and Discs**
- **Springs out of path of steam**
- **No dismantling for inspection**

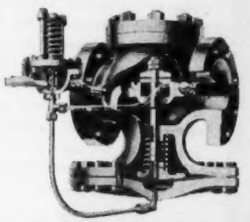
Write for Bulletin 350 for complete details on Spence's line of automatic regulating valves.



PRESSURE REDUCING—Self-operated, dead-end regulators powered by large, frictionless, metal diaphragms. Sizes 1/4 in. to 12 in. Pressures to 600 psi 750F.



TEMPERATURE REGULATING — Combined temperature and pressure control. No separate reducing valve required. Shuts tight, will not wiredraw or be damaged by overheating. Sizes to 12 in.



BACK PRESSURE CONTROL—Wide selection of sensitive pilots to meet exacting requirements. Initial pressure closing, guaranteed to shut tight. Packless construction, metal diaphragms.

LEVER OPERATED—Pilot lever for connection by cable or mechanical linkage to floats or other devices. Slight actuator motion opens and closes main valve.

SE 110

SPENCE ENGINEERING COMPANY, INC.
WALDEN, NEW YORK

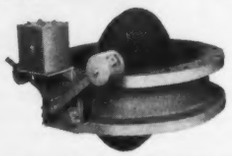
Spence

When inquiring check CP 2368 on handy form, pgs. 2-3

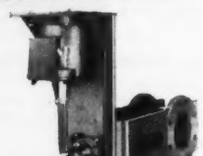
R-S valvEvents

• EXCERPTS FROM THE R-S BOOK OF EXPERIENCE •

WATER SERVICE—No. 825—36-inch 125-pound cast iron valve equipped with 18—8 shafts, bronze bushings and rubber seat for 85-pound drip tight shut-off.

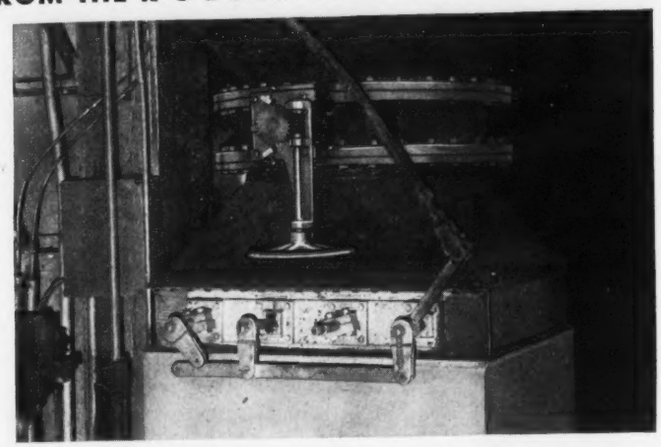


EMERGENCY OIL SERVICE—No. 628—solenoid trip valve. Should the solenoid function, the latch is tripped which causes the counter-weight to open or close the valve by gravity. Available in any metal or alloy and in various sizes for emergency shut-off or vent for air, gas, steam, oil, and water.



700° F. EXHAUST GAS SERVICE—No. 826—6-inch 125-pound R-S "H" metal valve used on small turbine generator. Equipped with 18—8 shafts, hastelloy bushings, finned lubricated stuffing box and solenoid trip mechanism.

STEAM SERVICE—No. 677—1500-pound welding end steel valve for superheated steam—A. S. M. E. Standards.



SEMI-SOLID SERVICE including abrasive and corrosive materials.

R-S VALVES
Control and Shut Off
Practically Any Material

The beveled vane seats firmly at a 12½° angle and is closed from a fully open position through 77½° of arc by either manual or automatic operation. A metal-to-metal seat gives satisfactory commercial shut-off. When required, Monel or stainless steel can be welded to the vane periphery and a babbitted seat used in the valve body. Drip tight or bubble tight closure can be obtained with a rubber seat.

Power controlled prime movers delivering the necessary foot pounds of torque open or close these self-cleaning valves at any desired speed from one second to eight minutes according to requirements. Pressures range from 2 to 2500 psig and temperatures from minus 300° F. to plus 2000° F.

Such simplicity of design, adaptability and operating ease are the reasons why R-S Valves can be installed to control and shut off the volume and pressure of any material that flows or is forced through a pipe.

Obtain full details from your R-S representative.

R-S PRODUCTS CORPORATION
4600 Germantown Avenue, Philadelphia 44, Pa.
An S. Morgan Smith Company Subsidiary

DISTRICT OFFICES IN PRINCIPAL CITIES

When inquiring check CP 2369 on handy form, pgs. 2-3

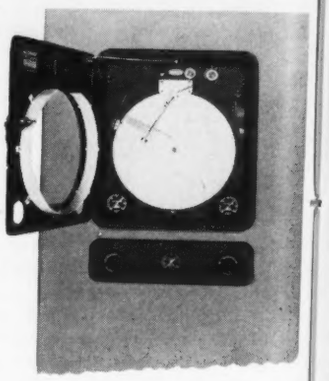
PROCESS INSTRUMENTATION

Series of pneumatic instruments operate on a different principle . . .

line handles pressures to 5000 psi, temps to 1000°F, flows from 20 to 200 in of water, level to 50 ft

Uses: Complete line of pneumatic instruments for controlling, indicating, and recording the usual process variables.

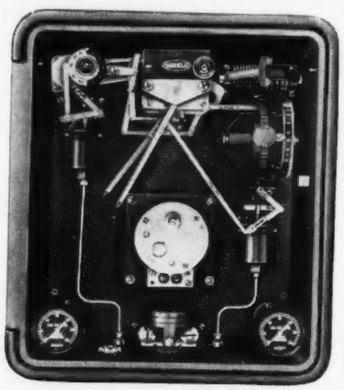
Features: Simple design is adaptable to a great variety of applications.



Controller with cover open

Description: Four basic types of control are offered in controllers of this line. They are: proportional control, proportional-reset control, on-off control, and differential gap control. In addition to this, supplementary characteristics can be built into controllers. This allows for pneumatic-setting, time cycle work, differential control (from 0 to 50% of range), and manual control.

Indicators, controllers, recorders, and combination instruments are capable of working with pressures to 5000 psi, temperatures between minus 40 and 1000°F, flow rates (differential pressures) from 0-20 to 0-200 inches of water, and liquid level up to 50 feet of water. All these instruments are furnished in a universal case for surface or flush mounting. Proportioning mechanism incorporates a gimbal mechanism and provides for setting proportional band or reversal of control with one adjustment. There are no links to change. This same adjustment is used for differential gap control. The proportional and proportional-reset mechanisms are interchangeable.



Controller with recording chart removed

(Announced by Mason Neilan Regulator Co., Dept. CP, 1190 Adams St., Boston 24, Mass. . . . or for more information check CP 2370 on handy form, pages 2 and 3.)

Forewarns of breakdowns in plant equipment electronically . . .

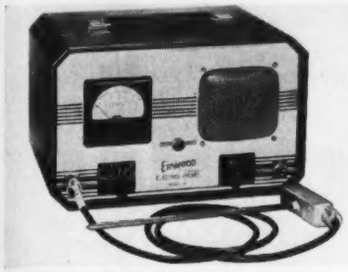
probe employs "a thousand ears" to provide quick, accurate diagnosis of machinery

Uses: For detecting failures, leakages, or stoppages in machines and systems.

Features: Acting as a "third ear", a thousand times more sensitive than a human ear, electronic probe gives quick, accurate answers to many problems of manufacture, inspection, maintenance, and service. Eliminates

time loss and expense of guesswork; is unaffected by air-borne noises.

Description: Incorporating a pick-up probe and 3-stage high gain amplifier, electronic device is sensitive only to vibrations at the point of contact. Besides a 4" speaker and phone jack provided for audible comparison of sound, there is a calibrated meter for visual indication. Meter and amplifier can be used together or separately. When head phones are used with this unit, the speaker is shut off automatically.



Electronic trouble spotter locates, analyzes, compares vibrations and noises in mechanical devices

Calibrated step attenuator switch just below the face of meter provides complete coverage of 60 db, 10 to a step.

Meter is accurate within 5%. Specifications listed include: amplifier gain, 95 db; shipping weight of unit, 14 lb. Operates on 36w, 110-120 v AC, 60 cps, and measures 10 x 6½ x 5¾".

(Product of the Erwood, Inc., Dept. CP, 1770 Berteau St., Chicago 13, Ill. . . . or for more information check CP 2371 on handy form, pages 2 and 3.)

Controls boiler water level and sounds alarm if level is high or low . . .

simple thermal expansion device has no bellows, weights, diaphragms, or liquid contacts

Uses: High and low water control for boilers automatically operates pumps and sounds or flashes alarm if desired.

Features: Alarm uses no bellows, weights, diaphragms, or electrical contacts in the liquid. This device controls electrical power with a minimum of moving parts.

Description: Copes Hi-Lo Water Alarm consists of a broad S-shaped bent pipe and a lever and switch system. This is mounted so that the middle of lower bend of the S corresponds to the normal water level of the boiler. With water at the normal level, lower half of the bottom of the S is filled with water and the full upper bend of the S is filled with steam. Levers attached to the pipe are in a floating position and do not depress switch contacts.

If water level drops so that entire S fills with steam, thermal expansion of the lower leg causes lower lever to depress switch contact. This may be used to sound alarm or to start a pump motor to feed more water to boiler.

When water level rises to fill half of the top bend, difference in thermal expansion causes an upper lever to depress a second switch. This signals that level is high enough.

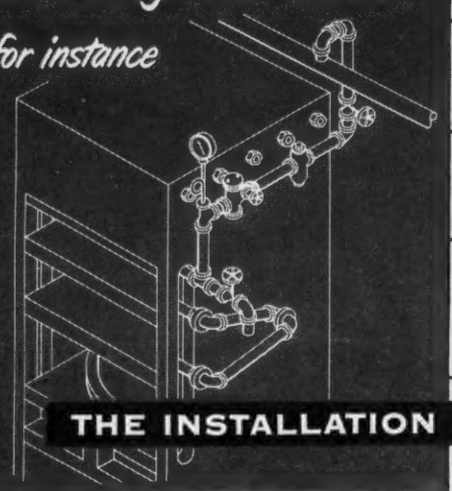
Alarm unit is mounted in a cabinet 30½ inches long and weighs 65 pounds. It has been used successfully on 1500 psi boilers.

(Product of Northern Equipment Division, Continental Foundry & Machine Co., Dept. CP, Erie, Pa. . . . or for more information check CP 2372 on handy form, pages 2 and 3.)

Will Your Pressure Regulators Last 25 Years?

...on Molding Press Service

for instance



THE INSTALLATION

Crane Brass Pressure Regulators on steam lines to rubber molding presses; Dryden Rubber Division, Sheller Mfg. Corp., Chicago. 225 units in service.

VALVE SERVICE RATINGS

FEATURES:	Equally good on steam or air
SUITABILITY:	Steady outlet pressure - No drift
MAINTENANCE COST:	Routine servicing only
SERVICE LIFE:	Many installed more than 25 years — Still O.K.
OPERATING RESULTS:	Fully automatic steam control at lowest cost
PRICE:	Good Buy - has no equal
AVAILABILITY:	Stock item in Crane Line

THE HISTORY

Steam generated at 130 psi is reduced through individual regulators on molding presses. Pressure used at machines is 60 to 100 psi depending on work. Features of regulator service needed most are: (1) nonfluctuating outlet pressure automatically maintained within close regulation; (2) easy adjustment by press operator to specified pressure for given work.

More than 25 years ago the plant standardized on Crane Regulators, a total of 225 being in use today. Many are the original installations, still delivering desired outlet pressure. Records for all regulators, regardless of age, show no maintenance cost other than prescribed simple routine servicing. On old models of the Crane 960 regulator, after prolonged service, this includes occasional regrinding of seats.

THE VALVE

Crane No. 960 Brass Pressure Regulators reduce steam or air pressures up to 250 psi, to within 80% of inlet pressure. Factory pre-set to operate within any of 4 ranges from 1 to 200 psi, with easily selected service pressure within set range. Precision made; fully automatic; highly dependable, even under reasonable fluctuation of inlet pressure. All wearing parts renewable. See your Crane Catalog or Crane Representative for full data.

The Complete Crane Line Meets All Valve Needs. That's Why—

More Crane Valves Are Used Than Any Other Make!

CRANE VALVES

CRANE CO., *General Offices:* 836 S. Michigan Ave., Chicago 5, Illinois

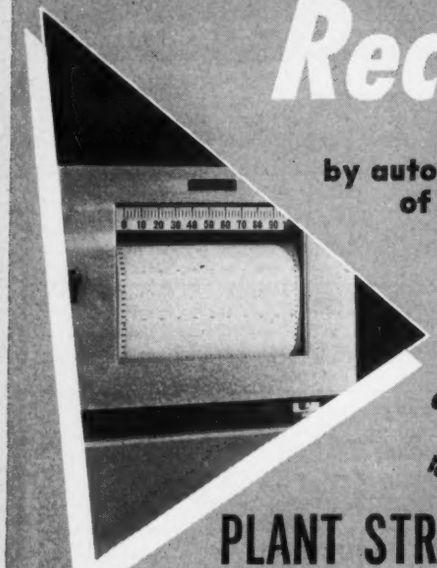
Branches and Wholesalers Serving All Industrial Areas

VALVES • FITTINGS • PIPE • PLUMBING • HEATING

When inquiring check CP 2373 on handy form, pgs. 2-3

CHECK YOUR **Sulfur Recovery**

by automatic measurement of SO_2 in vent gas



with this

continuously recording

PLANT STREAM ANALYZER

$ up the flue = $$ gone cloud-hunting . . .

An accurate, continuous check on the percentage of SO_2 present in the vent gas is a simple first step toward reducing this needless loss of sulfur. In this application, this continuously recording Plant Stream Analyzer has a sensitivity of 0.01% concentration using a full-scale deflection of 1% on the recording indicator. Strong absorption of infrared by SO_2 assures high sensitivity to this compound in the dry state.

This is only one of the countless applications of this sensitive, reliable, sturdy instrument in control situations where the concentration of an infrared absorber in the process stream is a critical index of operation. In many cases, the adaptation of the instrument for automatic control of the process itself is realizing huge additional savings.

▶ WRITE TODAY FOR BULLETIN 36.

PROCESS CONTROLS

a division of Baird Associates, Inc.

33 UNIVERSITY ROAD CAMBRIDGE 38, MASSACHUSETTS

When inquiring check CP 2374 on handy form, pgs. 2-3

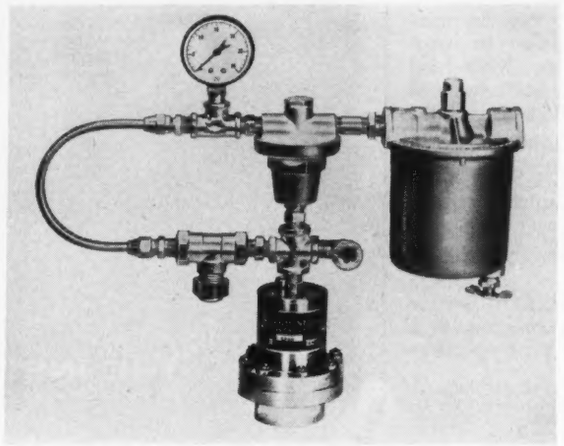
Measures liquid level, pressure, flow, specific gravity and vacuum . . .

absence of levers, pivots, and fulcrums promotes sensitivity of pneumatic transmitter

Uses: For measuring specific gravity, pressure, flow, vacuum, and liquid level in pressure and vented tanks.

Features: F-C pneumatic transmitter employs force balance air flow principle. No levers, pivots, or fulcrums are used in its construction, thereby promoting high accuracy and sensitivity (±.05" of water).

Description: Materials from which the 5000 Series F-C transmitter is made be varied to suit application,



When used in pairs, pneumatic transmitter measures differential pressures

although there are five standard selections for body construction and seven different diaphragm materials.

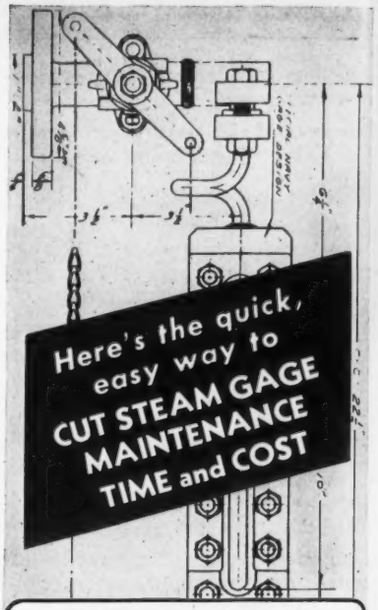
Another feature of the transmitter is the isolation of the transmitting air pressure from the material whose properties are being measured by the diaphragm. This eliminates any possibility of aeration of the material which, in many applications, would be troublesome or prohibitive. By the same token it is impossible for the measured material to enter the transmitting system in the event of air supply failure.

The receiver, whether it be a manometer, recorder, controller, pressure gage, or a pneumatically operated mechanism, may be located at the transmitter or in a remote position. A series of receivers, installed in various locations, may be actuated by one transmitter; or one receiver may be used for monitoring a number of transmitters by the interposition of a selector valve at the receiver station.

(Product of Instruments, Inc., Dept. CP, Tulsa, Okla. . . . or for more information check CP 2375 on handy form, pages 2 and 3.)

Signaling device locates data in visible record system

Eight-page bulletin describes signaling device used in visible record systems to indicate items which vary from normal status. Special record cards have data posted on them appropriate to inventory, production control, personnel, installment records, etc. Signal device slides along track and snaps into die cut slot corresponding to desired figure and date on visible margin of record. Each signal



Install Labor-Saving JERGUSON STEAM GAGE UNITS

. . . with gage and valves furnished as integral unit . . . without gage connection stuffing boxes or end stems.

JERGUSON Steam Gage Units, with gage and valves fabricated as a complete working unit will help you eliminate a lot of your maintenance time and troubles.

Especially designed to cut maintenance time, these complete units have no gage connection stuffing boxes to take care of and no end stems to cut or wire draw.

Gages and valves are an integral unit and have special expansion coils to take care of expansion and contraction. Transparent gage may be rotated to any desired angle; chambers and covers are forged steel; glasses are mica protected against erosion. Available in various models for required visible glass and W.S.P.

Cut your maintenance costs now. Write today for copy of drawing GD-515 and Steam Gage Data Unit.

JERGUSON

Gages and Valves for the Observation of Liquids and Levels

JERGUSON GAGE & VALVE COMPANY

100 Fellsway, Somerville 45, Mass.

Representatives in Major Cities

Phone Listed Under JERGUSON

Jerguson Tress Gage & Valve Co. Ltd., London, Eng.

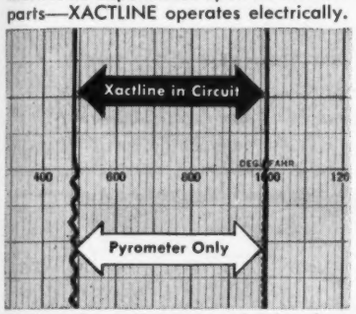
When inquiring check CP 2376 on handy form, pgs. 2-3

Automatic
"STRAIGHT-LINE"
TEMPERATURE CONTROL
with XACTLINE

ELIMINATE
Overshooting
Undershooting

Are you going to continue to put up with that troublesome overshooting and undershooting inherent in your conventional pyrometer control—especially when it is so easy to eliminate that saw-tooth effect?

Put XACTLINE in the control circuit. XACTLINE anticipates the temperature changes—before they occur. And too, it nullifies the varying amounts of thermal lag, residual heat, and mechanical lag—producing a short on-off cycle resulting in "Straight-Line" temperature control. This performance is possible because there is no dependence upon mechanical parts—XACTLINE operates electrically.



Exact reproduction of temperature chart for a heating process showing the comparison of the "Straight-Line" temperature control produced by XACTLINE and the saw-tooth curve obtained with only conventional control.

XACTLINE is applicable to any indicating or recording pyrometer control of the millivoltmeter or potentiometer type. It should be used wherever close temperature control is required—any type of electrically heated oven, furnace, kiln, injection molding machine, and fuel-fired furnaces equipped with motor-operated or solenoid valves.

XACTLINE is a complete unit. No adjustment or coordination with the control instrument is required regardless of the size of the furnace, length of the heating cycle, or size of the load. Installation is very simple—can be either flush or surface mounted.

PRICE **$89.50** F.O.B. CHICAGO
Nothing else to Buy

GORDON SERVICE

CLAUD S. GORDON CO.
Manufacturers & Distributors
Thermocouple Supplies • Industrial Furnaces & Ovens
Pyrometers & Controls • Metallurgical Testing Machines
Dept. 19 • 3000 South Wallace St., Chicago 16, Ill.
Dept. 19 • 2035 Hamilton Ave., Cleveland 14, Ohio

When inquiring check CP 2377 on handy form, pgs. 2-3

is formed with two blisters, accurately spaced to fit into oblong slots on record card.

Various types of visible record equipment are described in three-color bulletin. Bul KD 680 is issued by Remington Rand Inc., Dept. CP, 315 Fourth Ave., New York 10, N. Y. When inquiring specify CP 2378 on handy form, pages 2 and 3.

Two-switch system can maintain level in bins . . .

normally open or normally closed, switches can be mounted in bins despite heavy duty or explosion hazard

Two additions to a line of Tellevel Automatic Bin-level Control Switches extend usefulness of the devices to explosion hazardous materials and to lump material.

Explosion-proof Tellevel is designed for operation with explosive vapors and dusts. It has been approved by Underwriters' Laboratories for such classifications as ethyl ether, gasoline, alcohol, acetone, coal, grain, and flour. Operation depends on rising or falling of material level in bin to push plastic "float" sideways. This, in turn, actuates an enclosed micro switch.

Coal, stone, ore, or other heavy materials with lump sizes of 3/4-inch and above can be handled with a heavy-duty model. Instead of the plastic float, this device is equipped

Left to right: Heavy-duty, normal-duty, explosion-proof

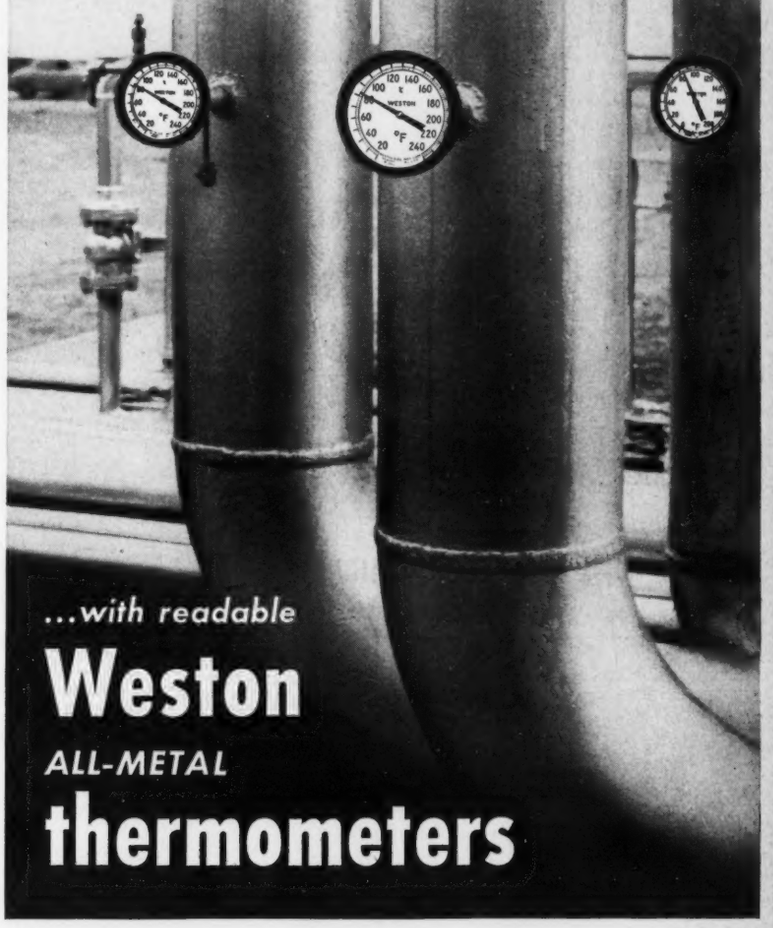
with a heavy steel cone. A rubber cup at the base of the housing forms a dust and moisture-proof seal to protect the switch mechanism. Sturdy steel housing is also used to further protect switch mechanism.

Shipped ready for installation, the switches are accompanied by wiring diagrams. These explain direct control of conveyor units, warning signals, etc. Two of the switches can be used in a bin to call for material as bin empties and cut off feed when bin is full. Automatic control of this kind can be agumented with a manual control system, too.

Units have coded pig-tail wire, ready for connection. They can be hung from pipe conduit.

(Stephens-Adamson Mfg. Co., Dept. CP, Aurora, Ill. is the maker . . . or for more information check CP 2379 on handy form, pages 2 and 3.)

Temperatures *stand right out...*



...with readable
Weston
ALL-METAL
thermometers

Large, readable scales . . . durable, all-metal construction . . . stainless steel stems . . . accuracy within 1% of thermometer range. Available in types, sizes, stem lengths and ranges for all applications. Write for literature.
WESTON Electrical Instrument Corporation,
617 Frelinghuysen Avenue, Newark 5, N. J.
. . . manufacturers of Weston and TAG instruments.

WESTON TAG 9882 **WESTON** *Instruments*

INDICATE . . . RECORD . . . CONTROL

When inquiring check CP 2380 on handy form, pgs. 2-3

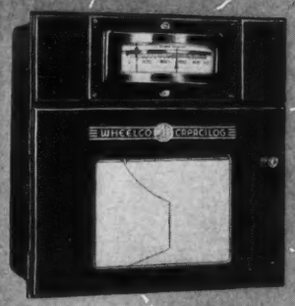
wheelco instrumentality

VERSATILE
variety of control

SIMPLE
interchangeable assemblies

ACCURATE
¼ of 1% of full scale

ECONOMICAL
low original cost



capacilog recorder

Capacilog Strip Chart Recorders operate with the Wheelco "Electronic Link" to provide a permanent record of temperature or other variables in chemical processing. All standard control combinations including pneumatic and electrical proportioning types are available.

For complete information on custom recording at "mass production" prices, ask for CAPACILOG BULLETIN C2. Wheelco Instruments Company, 841 West Harrison Street, Chicago 7, Illinois

wheelco electronic controls

Manufacturers of Capacitrol electronic controllers; Flame-otrol combustion safeguards

When inquiring check CP 2381 on handy form, pgs. 2-3

PROCESS INSTRUMENTATION

Checks low wattages with odd frequency or waveforms . . .

AC power from 0.003 to 300w can be read accurately to 2%

Uses: Checking power of low wattage devices with sinusoidal or non-uniform waveforms in the frequency range from 20 to 3000 cps.

Features: High impedance (500,000 ohms) input and electronic amplifier give faithful potential signal at dynamometer wattmeter without either loading the circuit or losing harmonics.

Description: Amplifier of the Model 109 Electronic Wattmeter drives the potential coil of a built-in dynamometer wattmeter. Sensitivity

500,000-ohm input doesn't load circuit

enables this instrument to be used with low-level circuits or those with a low potential at frequencies from 20 to 3000 cps. Maximum allowable current is one ampere, but external shunts are available for currents of 3, 10, and 30 amp.

Ranges of 300, 100, 30 . . . 0.1, and 0.03 watts have a full scale accuracy of about two per cent.

(Development of Keithley Instruments, Dept. CP, 3868 Carnegie Ave., Cleveland 15, Ohio . . . or for more information check CP 2382 on handy form, pages 2 and 3.)

Amplifies and controls from transformer's signal . . .

produces positive response to movements of less than 0.0001"

This amplifier-relay is specially designed for use with manufacturer's differential transformer sensing elements and, when so used, provides positive electrical response to movements of 0.0001 inch and less by the

CAMBRIDGE
VOLTAMOSCOPE
(an indicating instrument)
AND
VOLTAMOGRAPH
(a recording instrument)
FOR
POLAROGRAPHIC
ANALYSIS

The VOLTAMOSCOPE is a non-recording instrument on which the voltage and current are read and manually plotted. Many chemical determinations are simply made by reading the currents of two known voltages and finding the difference.

The VOLTAMOGRAPH consists of a robust pen-writing galvanometer with amplifier and a potentiometer with chart driving mechanism. Suitable for industrial and research purposes. The voltage-current graph is automatically drawn. Operates directly from A. C. line.

Identical electrodes are used for both indicating and recording models. *Write for bulletin B 255.*

CAMBRIDGE INSTRUMENT CO., INC.
3706 Grand Central Terminal, New York 17, N. Y.
PIONEER MANUFACTURERS OF PRECISION INSTRUMENTS

When inquiring check CP 2383 on handy form, pgs. 2-3

B/W
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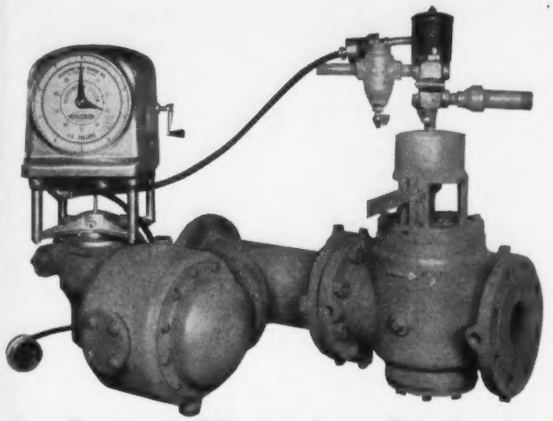
Floatless ALL ELECTRIC
LIQUID LEVEL CONTROLS
FIRST and FOREMOST IN THE FLOATLESS CONTROL FIELD
B/W CONTROLLER CORPORATION
2204 E. Maple Road
Birmingham, Mich.

When inquiring check CP 2384 on handy form, pgs. 2-3



Jacketed Metering Systems

for automatic batching of viscous materials

The Fluidometer System is available either jacketed or unjacketed. A jacketed Fluidometer System will handle heavy, hot, sticky materials as easily, as safely and as accurately as the unjacketed Fluidometer handles light, easy running liquids.

Fluidometer's accuracy and dependability have been proved in years of service under widely varying conditions. Anything that can be handled through a meter can be automatically batched by Fluidometer.

Write for Bulletin FL-49.

HETHERINGTON & BERNER INC.
711 Kentucky Avenue **Indianapolis 7, Indiana**

When inquiring check CP 2385 on handy form, pgs. 2-3

For MODERN
Chemical Analysis
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Process Control

. . . Use the New HELLIGE
Chromatron
PHOTOELECTRIC COLORIMETER and TURBIDIMETER

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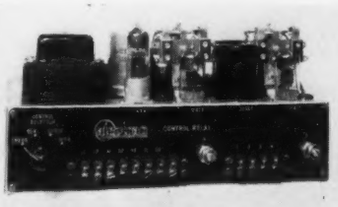
Write Today!

When inquiring check CP 2386 on handy form, pgs. 2-3

armature of the transformer. Numerous models of transformer are available and can be applied to measurement of pressure, flow, motion, force, etc.

Movement of the tranformer armature away from its null point generates a signal having amplitude and phase



Can be operated 5000 feet from site of measurement

definition. Control relay can be set to pull in or drop out on receiving this signal. Mounted 5000 feet from the site of measurement, the relay still operates satisfactorily and is not affected by changes in line voltage. Both repeat cycle — one direction, or repeat cycle — both directions operations are possible.

Chassis of the relay is compact, has all working and plug-in components accessible on top of unit. Case is welded sheet steel, is dust free, can be surface mounted.

(Development of Automatic Temperature Control Co., Dept. CP, 5200 Pulaski Ave., Philadelphia 44, Pa. . . . or for more information check CP 2387 on handy form, pages 2 and 3.)

Records flow to 15, 50, or 110 gpm

Four-page bulletin presents specifications of three sizes of flow meter with capacities of 15, 50, or 110 gpm. Meters may be used for checking incoming deliveries of liquids, withdrawals from storage, ingredients used in batching or blending, etc. Units measure by positive displacement and retain accuracy within wide range of flow and pressure.

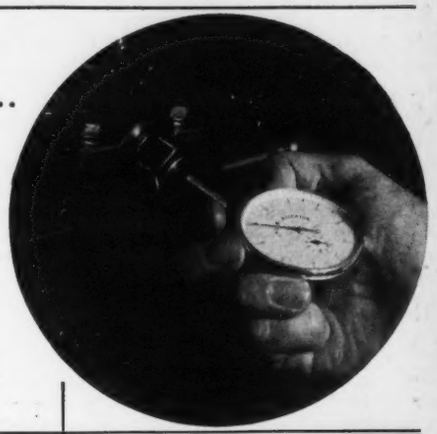
Cutaway illustration shows interior and exterior parts of meter. Smallest capacity meter functions at maximum of 200 psi. Other two models operate at maximum of 125 psi. Flow chart shows approximate pressure drop of the three sizes of meter. Six dial types are briefly described.

Interior working parts of meter are made of carbon and stainless steel. Exterior may be constructed of cast iron, bronze, or stainless steel. "Xacto Meter" is issued by Bowser, Inc., Dept. CP, 1365 E. Creighton Ave., Fort Wayne, Ind. When inquiring specify CP 2388 on handy form, pages 2 & 3.

BIDDLE *Instrument News*

IF YOU MEASURE *SPEED*
YOUR BEST BET IS *BIDDLE*

***If you want*—Readings of**
AVERAGE RPM or FPM...



—choose one of the several ranges available in **Jagabi® Chronometric Speed Indicators** from 0-100 up to 0-100,000 rpm. The shaft or spindle is set in ball bearings. No lubrication needed. Design and construction of these instruments is such that a minimum of maintenance is required even in constant, severe service.

The **Jagabi Tachoscope,** stop watch and revolution counter, is also recommended for high accuracy work. **BULLETIN 35-CP.**

***If you want*—Readings of**
INSTANTANEOUS SPEEDS or VARIATIONS in SPEEDS

. . . select the **Jagabi® Centrifugal Tachometer**—speed ranges 25 to 48,000 rpm. Three—and five—ranges in one instrument . . . or the **Dr. Horn Tachometers** which are made with 6 ranges between 25 and 30,000 rpm. Both Jagabi and Dr. Horn Tachometers have a special friction coupling which minimizes the damaging effects of too fast acceleration and over-speeding. Results: Low maintenance and long, dependable service life, for direct indicating, rpm shaft or fpm linear and peripheral speeds and speed variations. **BULLETIN 35-CP.**

B-812

If you want*— QUICK and ACCURATE RPM READINGS with *SAFETY

. . . Consider the advantages of **Frahm® Resonant Reed Tachometers** for hand use or permanent mounting.

No contact with moving parts is required. Just touch the instrument to the chassis, frame or housing of the machine or motor and read the rpm directly. No moving parts. No lubrication or maintenance required. Accurate to ½ of 1%, they will operate continuously for years without any appreciable change. Instruments with limited ranges available for as little as $27. Practically any desired range within 900 and 100,000 rpm can be supplied. **BULLETIN 41-CP.**

JAMES G. BIDDLE CO.

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Gentlemen:
Please send me material checked:
☐ 35-CP ☐ 41-CP

NAME
JOB FUNCTION
COMPANY
ADDRESS

When inquiring check CP 2389 on handy form, pgs. 2-3

Variety of resistance thermometers employ Wheatstone bridge for exacting work . . .

ten of these elements differ in resistive metals and in sheathing material

Designed for use with almost any Wheatstone bridge, Fuse-Din resistance thermometer elements can be had for service from –400°F to 3000°F. In fact, one bulb can be furnished which will cover this entire range.

In order to simplify use of the elements with various models of bridge, the resistance of the element at the ice-point has been set at exactly 100 ohms. Every bulb is supplied with a table of the ratio between resistance at measured temperature and resistance at the ice-point. Since the ice-point resistance is 100 ohms, this ratio can be read directly from the balanced bridge. Temperature, in turn, is then read from the corresponding value of the table.

These are the elements currently offered:

Type	Description
BA	glass and pyrex
BD	same with high speed tip
BR	same for extreme response speed
MQ	molybdenum in quartz
BM	metal clad, tungsten in pyrex
MM	metal clad, molybdenum in quartz
PP-1, PP-2, PPC, PC	platinum element

Type PPC can be used at temperatures of 3000°F.

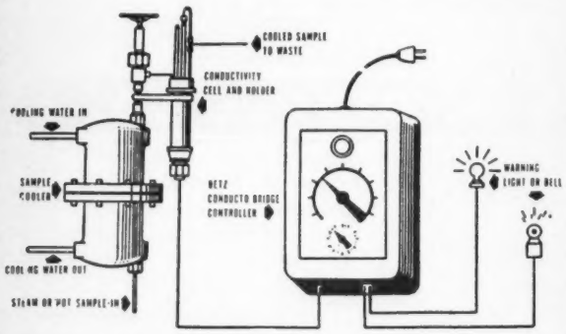
(Weiller Instruments Corporation, Dept. CP, 95 Broad St., New York 4, N. Y. is the maker . . . or for more information check CP 2390 on handy form, pages 2 & 3.)

Steam purity and corrosivity must both be determined for best results . . .

conductance tests will indicate solids content, but corrosivity should be checked with metal samples

That solids content of steam is a definite and important factor in steam purity is well known. A factor not so well recognized, however, is the corrosivity of the steam and condensate.

Among the most convenient ways of checking solids content is the use of a conductivity measurement on the conden-



Simple alarm and indicating system for solids content

sate. If appreciable carbon dioxide or ammonia is present it is necessary to determine them and subtract their conductivity from that of the condensate in order to find the solids. In a degassed sample, or after such a correction has been made, solids content can be calcu-

Instrument Man's Instrument

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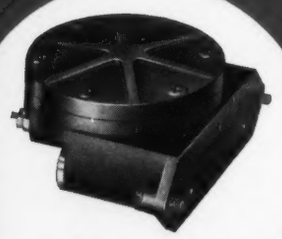
The New Masoneilan "6-in-1" Controller
IS SIMPLE AS A B C

One Setting of basic "6-in-1" controller
selects on-off, proportional, or differential-gap control; direct or reverse action; proportional band or differential-gap setting.

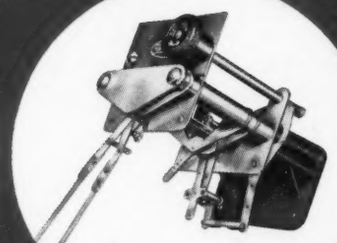
Easy to Set, Adjust, Test and Service —
all settings made without removing chart; all subassemblies complete and directly accessible; all air passages manifolded; four-position transfer switch in manual control subpanel.

Easy to detach and interchange subassemblies
from backplate-manifold to vary desired control function; for cleaning or servicing.

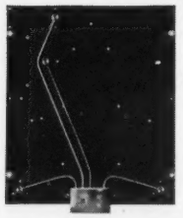
Available Now for Prompt Delivery



4. RELAY PILOT
with cleanable orifice and integral filters.



5. PEN MOVEMENT
includes gearless index setting.



6. BACKPLATE-MANIFOLD
supports subassemblies; conceals, supports, tubing; eliminates fittings. (Rear View)

MASON-NEILAN REGULATOR CO.
1203 ADAMS STREET, BOSTON 24, MASS., U. S. A.

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When inquiring check CP 2391 on handy form, pgs. 2-3

lated from an average figure of 0.55 ppm solids per micromho specific conductance.

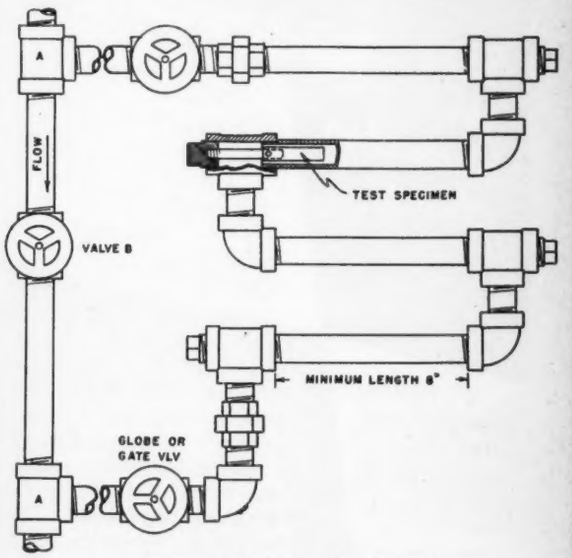
Conductivity instruments are available for indicating, recording, or setting off alarms based on solids content. Betz Conducto Bridge Controller is a simple conductance instrument which can be used as such an alarm and also as an indicator of solids content. Instrument can be used without degassing, although degassing is recommended where a number of variables in the process are being investigated.

In detailed studies, best practice is to install a degassing condenser. Measurements are then made with a conductivity recorder. Degassing may be necessary in either case if carbon dioxide and ammonia are high.

Corrosivity is generally due to carbon dioxide. Oxygen, of course, is dangerous in this respect but it is not so often present. It can enter the return lines where vacuum pumps are used and air is drawn into the return system, or where oxygen-containing water is admitted to the system.

Regardless of which gases are present, a practical method of checking corrosion is the placing of samples of metal in the condensate stream and checking their behavior on continued exposure. One reason for the superiority of this test is the fact that carbon dioxide can build up to high local concentrations even when it is not present to "dangerous" concentrations.

Typical test specimen by-pass installation can be set up as shown in illustration. Clean, flat metal specimens are thus inserted in the condensate line. They should be



Test specimen by-pass installation

kept covered with flowing condensate. In tests run by this method, steel or brass strips have to be weighed, inserted in the line, and taken out after a month or so of exposure. Weight changes and changes in the condition of the specimens show what the actual conditions are. After initial tests have shown these conditions, new specimens can be inserted for withdrawal at specified periods to show any trends in corrosivity.

(Summarized from "The Investigation of Steam Purity," *The Betz Indicator*, Vol 21, No. 1 (Jan 1952). W. H. & L. D. Betz, Chemical Engineers, Gillingham and Worth Sts., Philadelphia 24, Pa. . . . or for more information check CP 2392 on handy form, pages 2 and 3.)

Sets a NEW standard for TUBE ROLLING EFFICIENCY

AIRETOOL tube expansion control

Interested in speed and accuracy when you tackle a tough tube rolling job? Learn the facts about AIRETOOL'S amazing tube expansion control! Forget about performance records as you have formerly known them. For this control rolls twice as many tubes in the same length of time as ordinary tube rolling equipment and does it with unbelievable accuracy.

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No delicate electronic tubes needed
Permanent calibration . . . needs no adjustment

There's an AIRETOOL tube cleaner and tube expander for every type of tubular construction.

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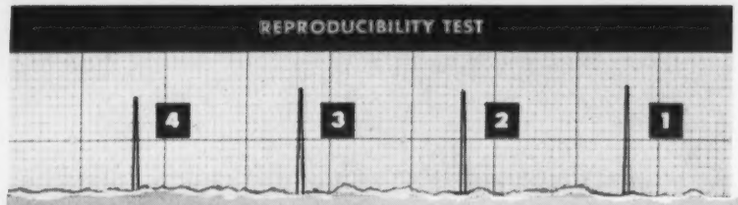
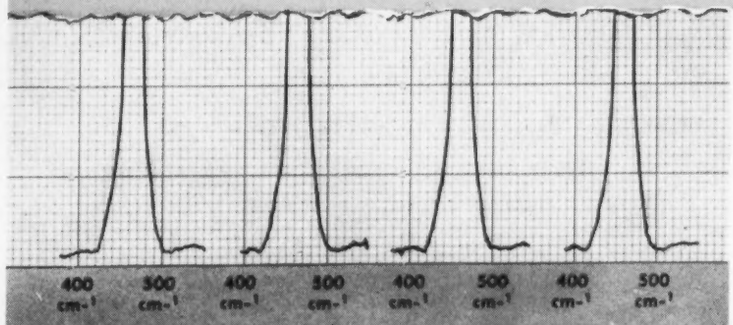
When inquiring check CP 2393 on handy form, pgs. 2-3



For the Laboratory

Different Approach to Spectrometry Yields Several Advantages



Trial No.	Hours	Line Intensity	Deviation
1	0.0	94.6	+0.45
2	0.7	94.2	+0.05
3	1.4	94.3	+0.15
4	2.0	93.5	−0.65

Average Line Intensity = 94.15
Average Deviation ± 0.3%

Sample: Carbon Tetrachloride
Volume: 21 ml
Filter: $NaNO_2$
Attenuator: 14.0 db
Zero Depression: 0
Time Constant: 12 sec
Primary Slit Width: 200 microns
Secondary Slit Width: 50 microns
Scanning Rate: 7 cm^{-1}/min
Chart Rate: 100 cm^{-1}/in

Raman spectrum is based on emitted light rather than transmitted or absorbed light

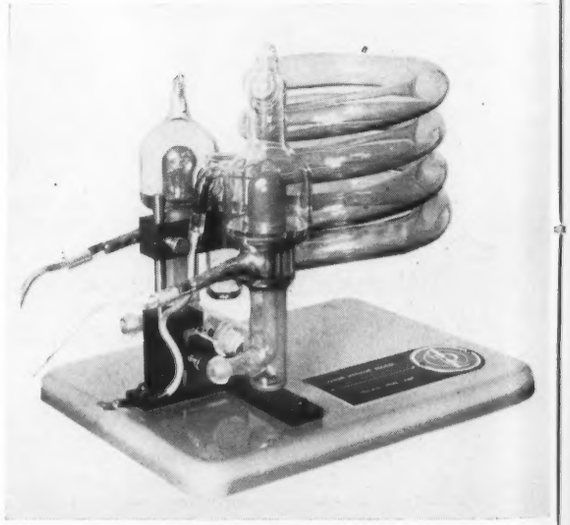
Both photographic and photoelectric-recorder work are possible with this particular unit

RAMAN spectra permit analyses of pure compounds and mixtures to be made over a range of wave numbers from 75 to 3500 cm^{-1}. Low frequency region (wave numbers of 400 and below) is of particular interest in analysis of haloparaffins, higher alcohols, napthenes, and higher straight-chain hydrocarbons.

Quantitative analysis is carried out using the characteristic lines of the spectrum. Unlike absorption spectrometery where a logarithmic relation exists between reading and concentration, Raman spectra usually show a direct lineal relation between reading and concentration. Even where interaction or overlapping occurs, simple working curves can be prepared.

Technique can be applied to qualitative and quantitative analysis of optically clear liquid mixtures or solutions of most organic and numerous inorganic compounds. Proper equipment can extend this method to cover gases, solids, and colored liquids as well. This equipment makes possible the recording of useful spectra in a routine manner, with short exposure times.

Raman spectra result from a light-scattering process and are observed as weak emissions rather than absorption or transmission. Another difference between conventional in-



Mercury light source

frared spectroscopy and Raman spectroscopy is the fact that water can be used as a medium for Raman work. These differences notwithstanding, in actual practice the difference between the two methods is one of technique.

ARL High Speed Raman Spectrograph is a stigmatic, three-prism instrument with a corrected reflective optics camera. Optical system is made up of glass elements, though salts are used as filters. Aside from spectrometry, it can be used for weak luminescence, emission from small samples, and electric discharge studies or other work requiring high speed and freedom from stray light. Camera aperture is 115 mm, giving a relative aperture of f/3. Baffles and magnesium fluoride coatings hold stray light to a minimum.

Photographic technique is valuable since an exposure of a few minutes indicates where all the Raman lines lie.

ADVANTAGES OF RAMAN SPECTROSCOPY

1 — Raman spectra complex mixtures are usually simpler than absorption spectra, thus are easier to interpret
2 — Entire spectrum can be recorded in one photographic shot
3 — Improved light source allows work in 75 to 750 cm^{-1} region (corresponds to 13 to 130 microns)
4 — Reading-concentration relationship is usually lineal
5 — Can be applied to aqueous solutions
6 — Optic system is all glass

Thus this single "shot" furnishes general information on backgrounds and relative intensities over the whole region. Explorations with photoelectric measurement and recordings can be planned from these photographic preliminary studies to make best use of time.

Normal scanning rate can be varied by means of a panel control knob from about 8 to 200 cm^{-1} per minute. With the most popular light source (4358 Angstroms) scanning time to provide exact intensity data would be about one hour. Lowest rate is 1 cm^{-1} per minute.

Mercury light source, a Helical Lamp, is operated at 15 amperes and requires a flow of cooling water. Previous light sources developed strong backgrounds at about 150 cm^{-1}, but present model permits work down to 75 cm^{-1} (about 13 microns).

(Equipment developed by Applied Research Laboratories, Dept. CP, 4336 San Fernando Road, Glendale 4, Calif. . . . or for more information check CP 2394 on handy form, pages 2 and 3.)

Scanning system monitors 270 separate temperature points

Four-page data sheet describes operation and lists pertinent details of automatic scanning system. Unit measures and records up to 270 separate temperature points. Scanning recorder, rectifier, and control units are pictured in addition to typical chart record showing off-limit points. Instrument provides a record of all of the points which exceed the preset limit.

System monitors a large number of temperature points automatically but is subject to manual control.

Flexible printing system may record temperatures continuously, only when set point is exceeded, or only manually selected points. Instrument incorporates visual and audible alarm system. Data sheet 10.0-9 is issued by Minneapolis-Honeywell Regulator Company, Dept. CP, Wayne and Windrim Aves., Philadelphia 44, Pa. When inquiring 2395 on handy form, pages 2 and 3.

Announcing . . .

THE NEW TORSION BALANCE LABORATORY SCALE

5 TIMES FASTER! UNAFFECTED BY DUST AND DIRT!

A completely new line of Laboratory Balances based on the famous Torsion Principle is now available! Now *all* weighing operations can be 5 times faster . . . And—you are sure of continuing accuracy. Here's why:

Only these new Balances incorporate these exclusive features:

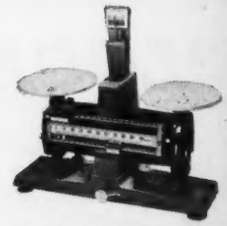
1. A specially designed oil dash pot to cut weighing time to 1/5 of that formerly required.

2. No knife-edge fulcrum to wear or become dull. Neither dust, dirt nor abrasive atmosphere can affect accuracy.

3. Higher sensitivity through long-lasting accuracy and adjustment.

What's more the newly designed graduated beams of Torsion Laboratory Scales simplify readings, while the beam's slide weights cannot cock and introduce errors.

Model IL-4, Capacity 4½ kilo.
Model IL-6, Capacity 2 kilo.



Model IL-7, Capacity 2 kilo.

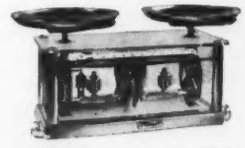
Model IL-3, Capacity 200 gm.

Model IL-5, Capacity 500 gm.

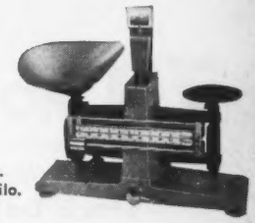
New, Streamlined Design

The clean, functional lines of the new Torsion Balances are the result of styling by Carl Otto, winner of the 1951 Industrial Designers Award. Finished in smooth, chemically resistant, baked enamel, the balances are available with round pans, flat pans or scoops.

Write today for further information about this amazing new line of Torsion Laboratory Scales.



Model IL-1, Capacity 4½ kg.



Model IL-2, Capacity 2 kilo.
Model IL-8, Capacity 4½ kilo.

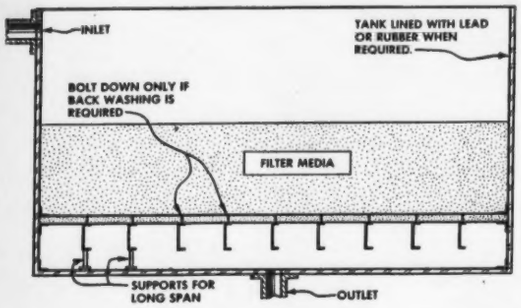
The Torsion Balance *Company*

MAIN OFFICE & FACTORY: CLIFTON, NEW JERSEY • SALES OFFICES: CHICAGO • SAN FRANCISCO

When inquiring check CP 2396 on handy form, pgs. 2-3

FOR CHEMICAL OR BRINE FILTRATION

..."ALOXITE" porous underdrains


INLET
TANK LINED WITH LEAD OR RUBBER WHEN REQUIRED.
BOLT DOWN ONLY IF BACK WASHING IS REQUIRED
FILTER MEDIA
SUPPORTS FOR LONG SPAN
OUTLET

Cross section of a typical circular or rectangular steel tank used for chemical filtration. If chemical attack is involved, the tank can be suitably lined and the plate supports covered.

Wherever any comparatively inert material (such as sand or "Anthrafilt") is used for filtering chemical solutions, brine, etc., it pays to support the filter media with a porous bottom. Specifically, an ALOXITE aluminum oxide underdrain system.

By eliminating the graded gravel, your initial investment is normally less. You get maximum flow through the filter, keep pressure loss to a minimum. Backwashing and cleaning is easy and efficient.

There are many possible applications. For example, rayon spin bath solutions — or the concentrated brine used for making chlorine or caustic soda by electrolysis — or brine used for regenerating zeolite softeners. And so on.

ALOXITE plates are inherently resistant to virtually all acids. They are very rugged for a ceramic product, and can withstand temperatures as high as 900° C. Various shapes are available for a wide range of equipment designs.

YOU'LL WANT OUR POPULAR BOOKLET. It's *the* up-to-date reference source on porous media. Its 56 pages cover *all fields of filtration and diffusion*—including information on applications, specifications, designs, installation and operation. Write for your free copy today.

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When inquiring check CP 2397 on handy form, pgs. 2-3

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"LOGAN"
AIR CONTROL VALVES

- BALANCED PISTON
- COMPACT DESIGN
- EASILY INSTALLED
- SELF-CLEANING

Model 6540
4-Way, 2-Position

Model 6245—4-Way, 2-Position

79 MODELS
Most Models Stock Delivery

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- HYDRAULIC CONTROL VALVES — CATALOG 200-4
- HYDRAULIC CYLINDERS — CATALOG 200-2; ALSO 200-3
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Air and Hydraulic Equipment

FLUID POWER SPECIALISTS SINCE 1916

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When inquiring check CP 2398 on handy form, pgs. 2-3

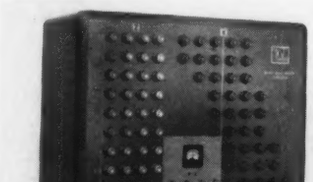
FOR THE LABORATORY

Non-technical operator consistently cracks tough equilibrium problems in four to six minutes . . .

and gets three-place accuracy with as many as ten components, using resistance-bridge computer

Flash equilibrium calculations, using the conventional step-wise procedure, ordinarily require up to an hour and one-half. With this electrical resistance-bridge computer, a non-technical operator can solve a flash equilibrium relationship in three to four minutes. Problems of this type must be solved in order to set optimum conditions for operations of fractionators and absorbers, as well as oil separators in petroleum refining.

Though computers of this type can be built to handle any number of components, the current instrument is designed for systems of no more than ten components.



Small enough to be carried by two men

Its answers are reproducible to three figures; absolute accuracy depends on the veracity of equilibrium constants used.

Computer solves implicit equations expressing phase equilibrium of hydrocarbon vapors and liquids at various temperatures and pressures. Data introduced to the machine consist of analyses of the feed in terms of mols of each component and equilibrium constants for each component in terms of the given temperature and pressure. Vapor-liquid system is represented by a resistance bridge network and the equilibrium condition is achieved by bridge balance as shown by a null-indicating meter.

Subsequent balances solve for the liquid fraction of each component and the total vapor mols per mol of total feed. Precision of the answers give liquid fractions for each component correct within plus or minus 0.05 per cent of the total liquid. Time required for the average problem is about five minutes. Another time saving results when much input data remains the same in a set of problems.

Manufacturer reports that similar computers have been built by some oil companies using multiple servo loops and multiple voltage regulators. He submits, however, that the bridge method is simpler, more reliable, and more precise than other methods.

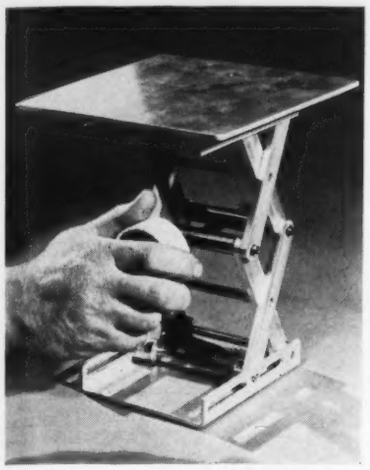
Small enough to be carried by two men, computer is powered by 110 volts AC, draws about as much power as a large radio.

(More information is contained in Bul 288-11 issued by Beckman Instruments, Inc., Dept. CP, South Pasadena, Calif. . . . or for more information check CP 2399 on handy form, pages 2 and 3.)

Adjusts to heights of 10¼" and under to provide safe support . . .

scissors-jack offers 5½ x 4¾" regular top and a larger 8 x 8" fit-over top for lab work

Especially well suited for jobs like raising and lowering oil and water baths, supporting hot-plates, large Dewar flasks and other laboratory equipment not easily clamped in place, Lab-jack is an all-purpose, general utility support.



Has many uses in the laboratory

Scissors-jack construction allows it to be folded down to slightly higher than three inches. Accurate height adjustment can be made for heights up to 10¼ inches.

Operation is controlled by a large plastic knob—there are no setscrews or thumbscrews.

Lab-jack is made of aluminum and stainless. Base and top plate dimensions are 5½ x 4¾ inches. An 8 x 8-inch plate is supplied to fit snugly on top to increase support area. A support rod can also be furnished. Total weight of jack is about 4 lb 10 oz.

(Manufacturer is Central Scientific Co., Dept. CP, 1700 Irving Park Road, Chicago 13, Ill. . . . or for more information check CP 2400 on handy form, pages 2 & 3.)

Stirs contents of narrow vessels with 120 one- or two-inch strokes per second . . .

collet takes ordinary stirring rod or helical stirrer for agitation of boiling and freezing point tests

Where thorough, regular agitation of narrow vessels is needed over relatively long periods of time, this No. 601 Electric Reciprocating Stirrer insures constistent results. It is particularly recommended for molecular weight determinations by the boiling or freezing point method. It can also be used in obtaining data for cooling curves where stirring should be constant over a long period of time.

For consistent results

Stirrer produces 120 strokes per minute. Stroke length can be adjusted for 1, 1½, or 2 inches by changing position of coupling in the driving disc. Special speeds are also available.

Collet of the 4-8-pound unit will hold a ⅛-inch stirring rod or a double helical stirrer supplied with it. Overall dimensions of the stirrer itself are: 9 x 4 x 8 inches. It is powered by 110v, 60 cps.

(Product of Research Appliance Company, Dept. CP, P.O. Box 413, Pittsburgh 9, Pa. . . . or for more information check CP 2401 on handy form, pages 2 and 3.)

TYGON *Versus* HF

"PROCEED with care" is sound advice wherever hydrofluoric acid is used or handled. This same advice also applies to the use of the versatile TYGON family of plastic compounds as protection against this highly corrosive acid. Properly used, TYGON does an excellent job of resisting HF in a range of concentrations and under a variety of conditions. Improperly used TYGON does not — cannot — give the maximum service possible.

The TYGON family consists of a series of polyvinyl resins carefully modified with other materials to give the ultimate in chemical resistance and physical properties. The many standard compounds available take the form of calendered or press-polished sheets, molded goods, extrusions, or protective coatings. Each form and each compound differs in its resistance to HF. Thus, to be effectively used, TYGON must be properly used.

In all exposures to hydrofluoric acid, TYGON may harden or discolor slightly, however, such minor changes do not affect protectability. In the case of TYGON sheeting, its resistance to hydrofluoric acid in concentrations up to 5% is excellent. Above 5% concentration, the resistance ranges from good to fair. Maximum service temperature for unprotected sheeting is 130°F. Above 130°F. an insulating sheathing consisting of carbon brick joined by a sulphur cement is recommended. With mixtures of HF and other chemicals, previous exposure tests or the counsel of U. S. Stoneware engineers is strongly advised.

TYGON sheeting finds use as a lining or covering for tanks, tank covers, diffusional towers, vats, bins, hoppers, troughs, blowers, impellers, fume hoods, and fume ducts. The sheets are also die-cut into gaskets, washers, and diaphragms for use in all types of process equipment.

When used as gasketing, TYGON resists all concentrations of HF at temperatures up to 130°F. This greater resistance results from only a relatively small area of the gasket being exposed. Higher service temperatures are possible, but depend upon the size, design, and specific use of the gasket.

As molded goods, TYGON takes the form of gaskets, grommets, washers, bumpers, handles, closures, and miscellaneous parts and fittings. In these forms, the resistance to hydrofluoric acid approximates that of the sheeting. Once again, resistance to greater concentrations at higher temperatures is possible according to the size, design and intended use of the molded part.

As an extrusion, TYGON is primarily used as tubing or piping. However, extruded cord, channel, and tape also find use as gasketing, expansion jointing, packing or wrapping.

TYGON Tubing is widely used in the laboratory because of its clarity, flexibility, inertness, long life and ease of use. The larger sizes, up to 2" ID, are also becoming commonplace in the plant for use as flexible piping in acid transfer lines, as flexible connections, as inlet and outlet ports on pumps and filters, as syphon hoses, and as line desurgers.

In extruded form, TYGON resists hydrofluoric acid in concentrations up to 10% and at temperatures as high as 130°F. Above these limits or in exposures to HF mixed with other chemicals, the resistance varies and previous tests or the advice of qualified engineers is advised.

As a protective coating, TYGON is used in the form of a solvent type paint or as a plastisol (TYGOFLEX).

TYGON Paint is used to protect equipment, structural steel, walls, and ceilings, against the fumes and spillage of all concentrations of HF at temperatures up to 130°F. However, the limits of a thin film should be realized and only brief or intermittent contact is advised. Furthermore, any spillage should be immediately washed away.

TYGOFLEX is used as a heavy duty coating or in the casting or "slush" molding of intricate parts and fittings. Its resistance to HF depends on thickness of the coating, but usually is satisfactory against concentrations as high as 15% and temperatures up to 130°F.

Properly used, TYGON provides effective and economical protection against hydrofluoric acid. However, for maximum service, care in selection of form and compound, previous tests, and the advice of U. S. Stoneware engineers is recommended.

TYGON plastics

In addition to TYGON in its various forms, we also manufacture a number of other materials capable of handling hydrofluoric acid in any concentration and under all types of operating conditions. These products include chemical stoneware and porcelain, acid proof brick and cements, and other organic linings and coatings.

Why don't you submit your corrosion problem today? There's no obligation and we'll be pleased to be of assistance. So write, now! 412C

THE UNITED STATES STONEWARE CO., Akron 9, Ohio

ENGINEERS, MANUFACTURERS, ERECTORS OF CORROSION-RESISTANT EQUIPMENT SINCE 1865

When inquiring check CP 2402 on handy form, pgs. 2-3

NOW Ready to Ship

Our Own Manufactured
High Quality, Lamination-Free

IMPERVITE

IMPERVIOUS GRAPHITE

Standard ⅞" 1" or 1½"*

TUBES

For 28-Day Delivery (or better)

Both the extrusion and impregnation are closely supervised in our own plants, to provide the *best* tubes for Falls Industries' full line of Impervite Heat Exchangers.

***Other Sizes Available**

You cannot find a more satisfactory tube for replacement or repair. The supply is plentiful.

PLACE YOUR ORDER NOW!

Falls Industries, Inc.
AURORA ROAD - SOLON, OHIO

When inquiring check CP 2403 on handy form, pgs. 2-3

FOR THE LABORATORY

Speeds acid additions ten times because of fast mixing . . .

"floating" baffle directs power

Uses: Fast, thorough mixing in laboratory or small scale production.

Features: In addition to the three-blade paddle, this mixer has a larger three-blade baffle which rides freely on the shaft. Retained in place only

One-half to three gallons at a time

by light chains, the baffle rises to surface when mixing starts. It prevents familiar whirlpool from forming, impeding liquid and folding it back upon itself.

Description: The two models of the Fisher-Goldman mixer currently offered differ only in power requirements. Model A is designed for 115 volts 60 cps; Model B for 230 volts 60 cps. Both employ a 1/6 horsepower motor.

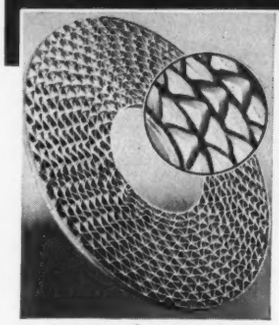
Mixer's merit can be shown in sulfonation of castor oil. Ordinarily when sulfuric is poured into the oil, local burning results because heat is not dispersed rapidly. Because of superior mixing, this device dissipates heat rapidly. Acid can be added in a single pouring — requiring only one-tenth the usual time — without burning the oil.

Paddles are adjustable for liquids of differing viscosities. This is the only adjustment required in operation.

Rotation speed is 275 rpm. Three-and-one-half-gallon mixing jar can be used for batches from one-half to three gallons. It has a slight conical bottom and is provided with a drain. Mixer motor swings out of the way for thorough cleaning.

(Developed by Dr. Bronislaw Goldman, the mixer is handled by Fisher Scientific Co., Dept. CP, 717 Forbes St., Pittsburgh 19, Pa. . . . or for more information check CP 2404 on handy form, pages 2 and 3.)

Does iron contamination affect your product?



STOP IT with the FERRO FILTER

A FERROFILTER GRID
Magnified inset shows iron particles collected on grid edges.

You can prevent microscopic ferrous particles from contaminating your product. Shown is the Pipeline model. Others available are Gravity Feed and Underfeed types. Also Dry FERRO-FILTERS for powdered and granulated materials. For more information —

Send for BULLETIN 46

S. G. Frantz Co., Inc.
P. O. Box 1138 Trenton 6, N. J.
Manufacturers of Permanent Magnet and Electromagnetic Separators

When inquiring check CP 2405 on handy form, pgs. 2-3

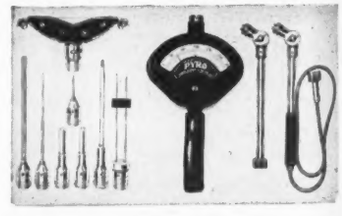
■ *Accurate Temperatures*
AT A GLANCE WITH THE SIMPLIFIED PYRO OPTICAL PYROMETER

Any operator can quickly determine temperatures on minute spots, fast-moving objects and smallest streams. Completely self-contained. No calibration charts or accessories needed. An accurate, direct reading Pyrometer that pays for itself by helping prevent spoilage. Weighs 3 lbs. Available in 5 temperature ranges (1400° F. to 7500° F.). Ask for *free* Catalog No. 80.

The Improved PYRO SURFACE PYROMETER

8 instruments in one, handles all surface and sub-surface temperature measuring jobs. Has selection of 8 types of thermocouples; all interchangeable in seconds with no recalibration or adjustment. Automatic cold end compensator.

Shock, moisture and dust-proof. Accurate, big 4¾" indicator. Available in 5 temperature ranges. From 0-300 to 0-1200°F.



ASK FOR FREE CATALOG No. 165

The Pyrometer Instrument Company
New Plant and Laboratory BERGENFIELD 28, NEW JERSEY
■ Manufacturers of Pyro Optical, Radiation, Immersion and Surface Pyrometers for over 25 years ■

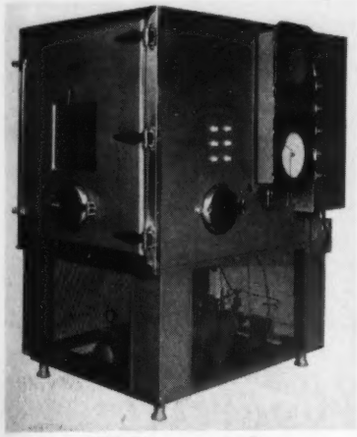
When inquiring check CP 2406 on handy form, pgs. 2-3

Condenser and refrigeration unit produce fast heat regulation throughout range . . .

humidity chamber runs hot and cold without getting all fogged up

Uses: Testing equipment or materials at controlled temperatures and humidities. Conditioning of samples.

Features: Positive, fast temperature changes can be made and held without troublesome condensation. Speed is attained by using either electric heaters or refrigeration unit; condensation is eliminated with a high capacity condensing system. Total workable range is 20 to 95 percent relative humidity at any temperature between (plus) 35 and 185°F.



20 to 95% RH over a 150°F range

Description: Ample working space (27 cubic feet) is provided in the humidity testing cabinet. Adjustable shelf brackets are of stainless steel, as are the two hand-hole ports. Six electrical leads are provided so that power can be furnished to equipment under test. Progress can be watched through a glass viewing panel with built-in wiper.

Forced air circulation, in conjunction with the condenser, prevents excessive condensation on items tested as the temperature is lowered. Refrigerator is hermetically sealed, thus also unaffected by moisture. And control switches are mounted externally on a panel which can be locked. Optional control equipment can also be provided to program both wet- and dry-bulb temperatures.

(Developed by Murphy & Miller, Inc., Dept. CP, 1326 S. Michigan Ave., Chicago, Ill. . . . or for more information check CP 2407 on handy form, pages 2 and 3.)

Thermometer markings stay readable despite acid exposures . . .

amber-colored filler prolongs life of laboratory thermometers with chemical resistant material

An amber-colored, easy-to-read filler that overcomes a common fault of thermometer markings disappearing through constant chemical action in the laboratory has been developed.

The new-type thermometers, were tested under conditions more extreme than those encountered in normal use. No damaging effects were reported on the filler after thermometers were immersed in acids, alkalis, and organic solvents at elevated temperatures for prolonged periods. Although some fading resulted from boiling alkali, which characteristically attacks glass, the filler proved as permanent as the thermometer itself.

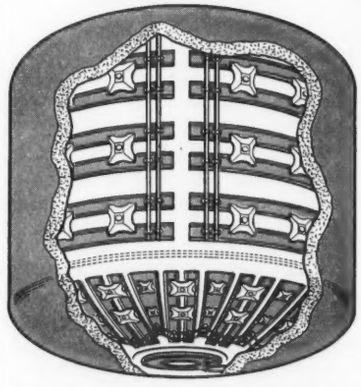
(Development of Kimble Glass Div., Owens-Illinois Glass Co., Dept. CP, Ohio Bldg., Toledo 1, Ohio . . . or for more information check CP 2408 on handy form, pages 2 and 3.)

Industry's Most Versatile Heat Source

Chromalox Electric Strip Heaters

Easy to Install CHROMALOX Electric Strip Heaters give clean, dependable and accurately controlled heat where and when heat is needed. They produce uniform and accurate temperatures by automatic or manual controls. Low initial costs, low installation costs and low operating costs are among the many advantages of using CHROMALOX Strip Heaters for heating liquids, gases, viscous fluids, tanks, platens, molds, moving parts, etc. Get the full details now.

A Typical Strip Heater Application from Our Files



Rugged, easily installed Chromalox Strip Heaters assure accurate temperature, dependable around-the-clock service.

Strip Heaters curved lengthwise at the factory fit snugly to tank perimeter and . . .

Strip Heaters curved slightly as installed conform to shape of convex kettle bottom, while . . .

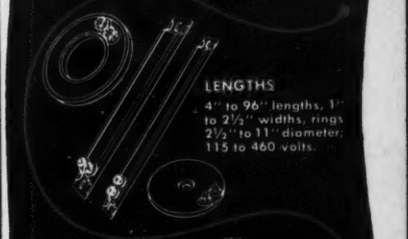
Segment Heaters fill the gaps.

IC-59

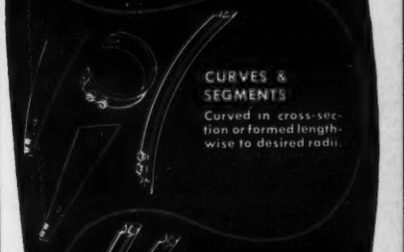
CHROMALOX

Electric Heat for Modern Industry

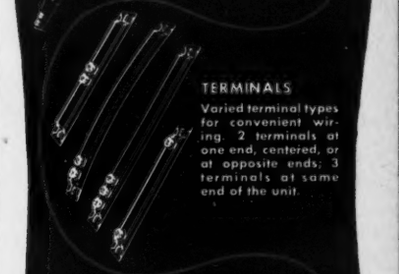
Sizes, Types and Sheaths for Every Need



LENGTHS
4" to 96" lengths, 1" to 2½" widths, rings 2½" to 11" diameter; 115 to 460 volts.

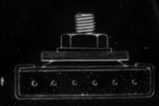


CURVES & SEGMENTS
Curved in cross-section or formed lengthwise to desired radii.



TERMINALS
Varied terminal types for convenient wiring. 2 terminals at one end, centered, or at opposite ends; 3 terminals at same end of the unit.

SHEATHS
Rust-resisting iron, high temperature steel and Monel sheaths to meet exact service conditions.



Want Ideas?

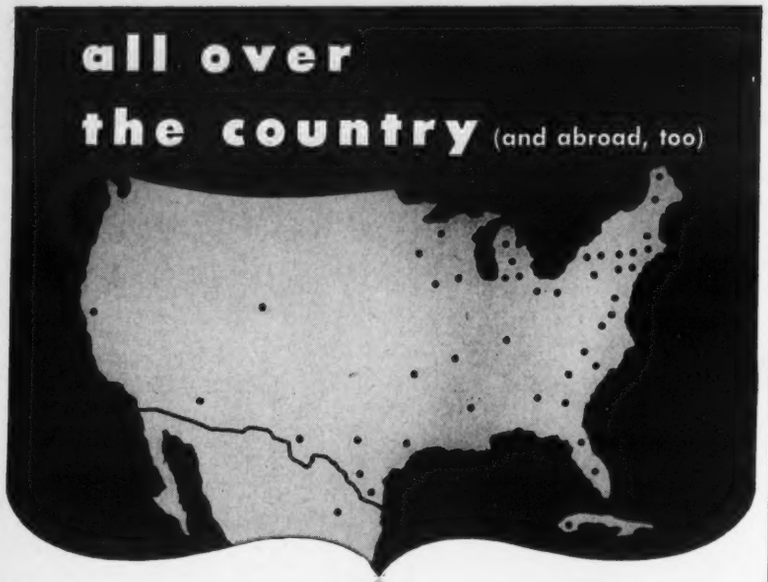
on how to use Chromalox Electric Heaters in your plant

Write for the data-packed Catalog 50 which describes many types of Chromalox Electric Heaters and how to apply them. It's yours without obligation.

EDWIN L. WIEGAND COMPANY
7517 Thomas Blvd., Pittsburgh 8, Pa.

When inquiring check CP 2409 on handy form, pgs. 2-3

all over the country (and abroad, too)



INTIMATE BLENDING EQUIPMENT —BY **SPROUT-WALDRON** DOES THE JOB!

Intimate Blending Systems are available in laboratory or commercial sizes...capacities up to 60 cu. ft.

Applications:
Agricultural Dusts • Brake Lining and Battery Case Formulas • Detergents • Dyes • Pigments, and many other fine powder blends.

SOUTH CAROLINA . . . "We are greatly pleased with the performance of our Sprout-Waldron Blending System. We believe without a doubt that the dust produced on our equipment surpasses anything else on the market in the South today. Producers of technical toxicants used by us agree with this opinion."

MAINE . . . "To meet peak demands during the dust season, levels as high as nine batches per hour are maintained for limited intervals with the same crew. Equipment must stand up."

GEORGIA . . . "Our production records show five distinct formulas totaling more than 450 tons were blended on our S-W equipment in the last three months, without any mechnical trouble whatsoever."

ARIZONA . . . "Everyone who visits our plant agrees that we have the most compact, efficient system they have yet seen."

PENNSYLVANIA . . . "Visiting representatives from Farm Co-ops in other states unanimously characterized our insecticide dusts as being the finest, most uniform blends they had ever examined."

Use the advice of Sprout-Waldron, Specialists in Intimate Blending, to improve your product . . . safeguard your personnel . . . step up production—and increase your profits. Write for Bulletin I-846 today! Sprout-Waldron & Company, Inc., 10 Logan Street, Muncy, Pennsylvania.

S W SINCE 1866

SPROUT-WALDRON

INTIMATE BLENDING

219

When inquiring check CP 2410 on handy form, pgs. 2-3

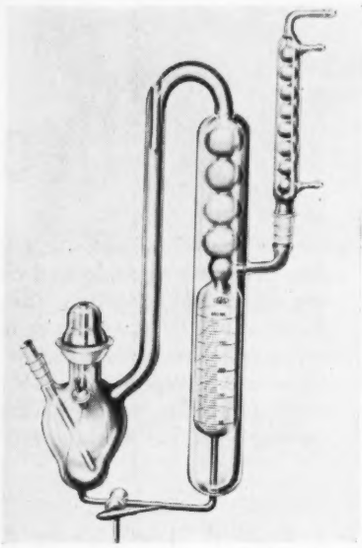
FOR THE LABORATORY

Flash vaporization data from two liters instead of two barrels . . .

allows single still operator to do other work, too

Flash Vaporization Equilibrium Still is accurate and simple to use. It is reported to obtain equilibrium flash vaporization data for petroleum mixtures as easily as ordinary boiling point data can be obtained.

Design is that of a modified Othmer Still used by numerous investigators with binary and ternary systems, and thoroughly evaluated at atmospheric and sub-atmospheric pressure for equilibrium conditions, entrainment, and pressure drop. Design also allows still to always reach true equilibrium — as opposed to results with continuously operated pilot plant equipment.



From initial boiling point through 92 per cent vaporization

Compact unit may be set up on a laboratory bench-top. A determination may be made with as little as 500 to 2000 ml per flash curve. Determination includes original boiling point of the mixture and all points of vaporization up to about 92 per cent. Since there is negligible pressure drop through the unit, manometer lead is located where condensing vapors do not clog it.

Because of the simple nature of the determination, only one operator is needed and he is free for other concurrent work.

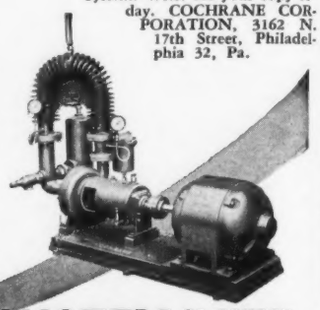
(Product of Emil Greiner Co., Dept. CP, 20-26 N. Moore St., New York 13, N. Y. . . . or for more information check CP 2411 on handy form, pages 2 and 3.)

FAST, UNIFORM HEAT NO FLASH LOSS CONDENSATE RETURNED TO BOILERS AT HIGH TEMPERATURE AND HIGH PRESSURE

These results are obtainable through the installation of the Cochrane C-B System, a completely closed circuit, with a jet pump and a centrifugal pump incorporated in one, draining hot condensate from steam process equipment and returning it to the boiler at close-to-process temperature and at high pressure.

Savings in fuel, increase in production, improved quality are all immediately obtainable with the installation of the C-B System.

Cochrane Publication 3250 gives complete information on the C-B System. Write for your copy today. COCHRANE CORPORATION, 3162 N. 17th Street, Philadelphia 32, Pa.

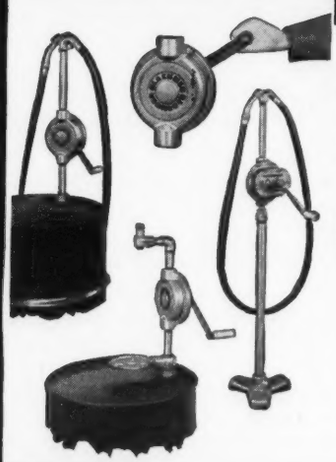


COCHRANE C-B SYSTEM OF CONDENSATE DRAINAGE CONTROL

When inquiring check CP 2412 on handy form, pgs. 2-3

BLACKMER HAND PUMPS

designed for *Liquid Materials Handling* IN YOUR PLANT



Speed liquid materials handling. Eliminate spillage. Promote safety. Cut costs. Blackmer builds the only complete line for industrial use.

MOUNT ON DRUMS, WALLS, MACHINES, WHEEL TANKS, SKID TANKS, UNDERGROUND STORAGE OR ON PIPELINES.

7 to 28 G.P.M.

For lube oils, solvents, paints, thinners, fuel oils, gasoline, cutting oils, soaps, and other liquids.

GET HAND PUMP DETAILS

Write for catalog folder "HP6" and price list.

BLACKMER PUMP COMPANY
1809 Century Ave., S.W. - Grand Rapids, Mich.

When inquiring check CP 2413 on handy form, pgs. 2-3

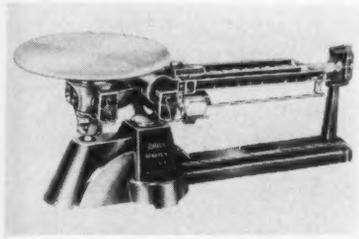
Tare weight factor is figured quickly with triple beam scale . . .

eliminates need for resetting balance each time to compensate for container

Uses: For laboratory or industrial application where it is desirable to obtain net value of product without further calculations.

Features: Empty container is balanced by use of tare poise which can be locked on the undivided tare rod for repetitive weighings. The value read on the balance after filling container represents the net weight only.

Description: Balance of triple beam scale is equipped with stainless steel plate and etched stainless steel beams. Features a full load capacity of 2610 gm with a sensitivity of 1/10 gm. Balance is supplied with patented self-aligning bearings and is finished in attractive and durable hammertone baked enamel. In addition to standard metric balance, scale can also be supplied in the avoirdupois or troy standards. Several types of weighing platforms such as removable brass scoop or removable pan are available for various industrial applications.



(Furnished by the Ohaus Scale Corp., Dept. CP, 1050 Commerce Ave., Union, N. J. . . . or for more information check CP 2414 on handy form, pages 2 and 3.)

Lightweight compression tester is air powered and suitable for field use . . .

ten-gallon tank of air at 100 psi powers this 350-pound-capacity tester for days

Uses: Compression and crushing tests of small metal, ceramic, wood, and plastic parts. Capacities from 350 to 1000 pounds are available.

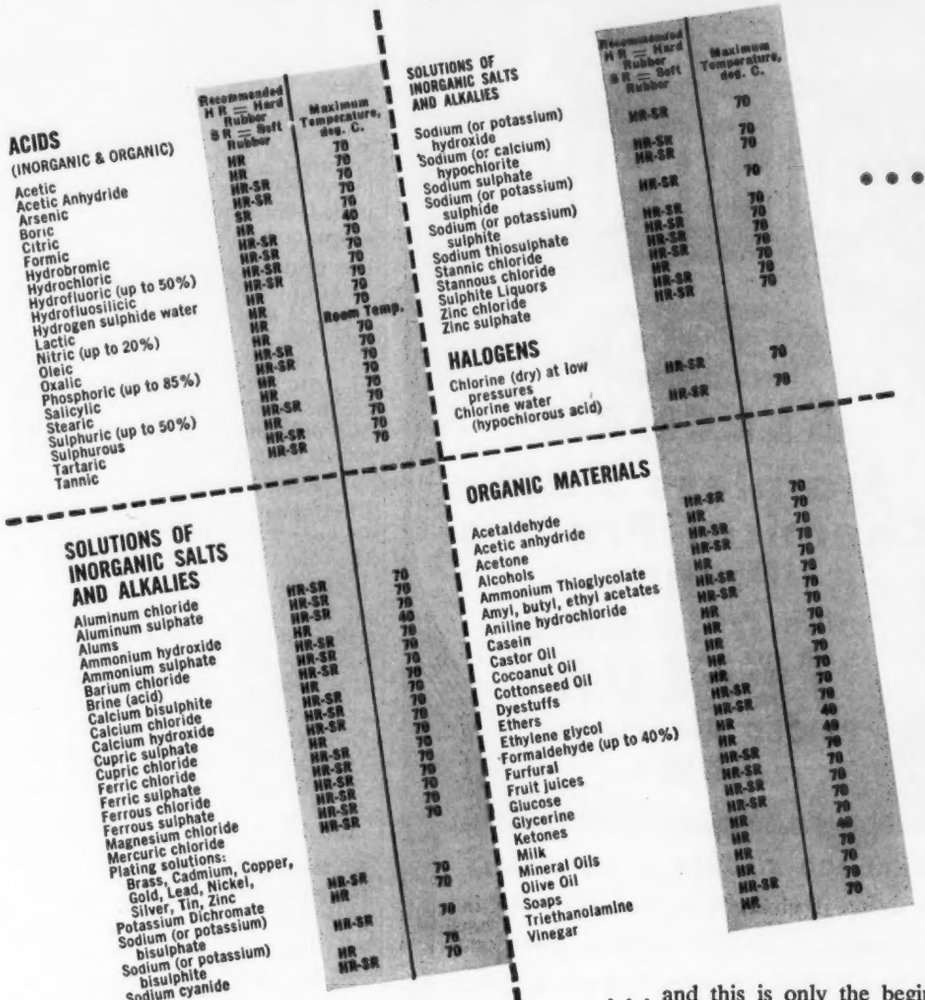
Features: Ordinarily powered by 100-psi air, testing machine may be used in the field by connecting it to a ten-gallon tank of air at 100 psi. In actual tests, fifty runs were made with the air pressure dropping to 90 psi in the tank.

Description: Portable hydraulic compression tester is powered by compressed air. Air itself acts as a piston, applying force to the oil of the hydraulic system. Applied load is indicated by a double proving ring. Ring has two scales and automatically switches from lower to higher scale when its lower capacity is reached. This method of operation allows use of the 0.1 pound sensitivity of the lower scale without danger of overloading.

Complete stress-strain diagrams may be plotted by reading the proving ring and a strain gage on the specimen intermittently throughout the run. Load may be released instantly at any time during the test. Instantaneous release can be had at the point of failure also, where specimen is kept intact for measurements or photographs. Air storage tank is also light in weight, has carrying handles.

(Product of Labquip Corporation, Dept. CP, 4520 W. North Ave., Chicago 39, Ill. . . . or for more information check CP 2415 on handy form, pages 2 and 3.)

which of these do you handle?



. . . these are jobs for **ACE®** **RUBBER-PROTECTED EQUIPMENT**

. . . and this is only the beginning. This list represents only a few of the actively corrosive solutions which can be handled economically by Ace rubber protected equipment. Ace Tempron, Neoprene, nitriles, copolymers and Ace Thermoplastics such as saran, polyethylene, etc., extend this range still further.

Ask our engineers to recommend the most economical corrosion-resistant equipment for your processes.

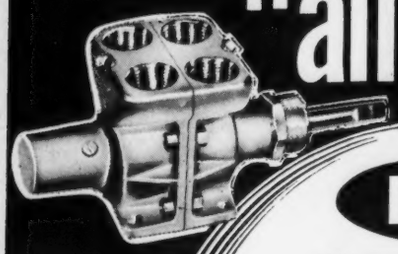
ACE rubber and plastic products

AMERICAN HARD RUBBER COMPANY
93 WORTH STREET • NEW YORK 13, N. Y.

When inquiring check CP 2416 on handy form, pgs. 2-3

NOW AVAILABLE FOR *IMMEDIATE DELIVERY* FROM STOCK

AMERICA'S NO. 1 "all-in-one"



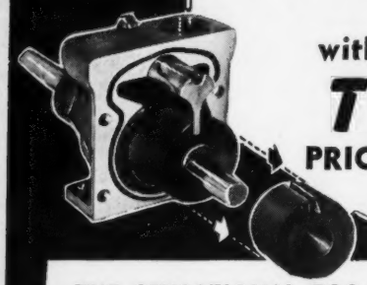
ECO

ALLCHEM

Stainless Steel Chemical Process Pumps with DUPONT TEFLON

PRICED AMAZINGLY LOW!

INTERIOR VIEW TEFLON IMPELLER



THE SENSATIONAL ECO ALLCHEM IS UNIVERSALLY APPLICABLE! • Conveys virtually all fluid chemicals in widest viscosity ranges • Handles anything glass can handle • Moves fluids, emulsions without shear, foaming or aeration • Chemically and biologically inert • Sustained linear delivery • Compact, gearless, positive displacement • Ideal for small volume process and lab work, transfer and pilot plant applications • Of special interest to pharmaceutical, fine chemical, and all process plants. Self-priming eliminates hazards of manual priming. Dupont Teflon Impellers will not shrink, crack, swell or harden in use—not subject to shelf deterioration • Capacities 1 to 10 GPM—operates in either direction under pressures to 70 PSI.

SEND FOR ECO PUMP BULLETIN CT 2

ECO ENGINEERING CO.

12 NEW YORK AVENUE NEWARK 1, NEW JERSEY

When inquiring check CP 2417 on handy form, pgs. 2-3

FOR THE LABORATORY

Lowers pressure drop for packed columns of lab size . . .

screen cubes provide superior performance in 2 to 6" diam columns

Uses: Packing for distillation and absorption columns (two to six-inch-diameter) in the lab or pilot plant.

Features: Pressure drop and height of a theoretical plate is reported lower with these than with other comparable packings.

Description: Octa-Pak is made up of tiny cubes of wire screen which are open on two ends. Edge of the cube is 0.205 inch. Screen itself is 50 x 50 square weave of wire 0.008 to 0.010 inch in diameter. These can be fabricated in brass, stainless 304 or stainless 316. Some other metals can also be used.

Minimum amount supplied is one liter (about 4500 individual pieces). Packed density depends slightly on the column diameter, but is close to 1.5 pound per liter.

As a packing material, Octa-Pak is described as non-tangling, non-telescoping, and mechanically strong. It allows high rates without flooding.

(Developed by Podbielniak, Inc. Dept. CP, 341 E. Ohio St., Chicago 11, Ill. . . . or for more information check CP 2418 on handy form, pages 2 and 3.)

No lugs, bolts required for supporting resistor . . .

with axial leads, they are designed to save space

Uses: For radio, electronic, and other electrical equipment.

Features: Miniature power type resistors are self-supporting, save space, and have permanently anchored axial leads tinned for easy soldering.

Description: Axiohm resistors are made with special alloy resistance wire of low temperature coefficient of resistivity wound on tough miniature ceramic cores. Entire assembly is encased in Vitrohm enamel forming a hard, crazeless, heat conducting hermetic seal. Resistors are available in conservatively rated 5 and 10 watt sizes. A variety of resistance values is available from stock. Standard resistance tolerance is ±5 per cent with special tolerances on order.

(Development of the Ward Leonard Electric Co., Dept. CP, Mount Vernon, N. Y. . . . or for more information check CP 2419 on handy form, pages 2 and 3.)

HUMIDITY

Within 1° Wet Bulb

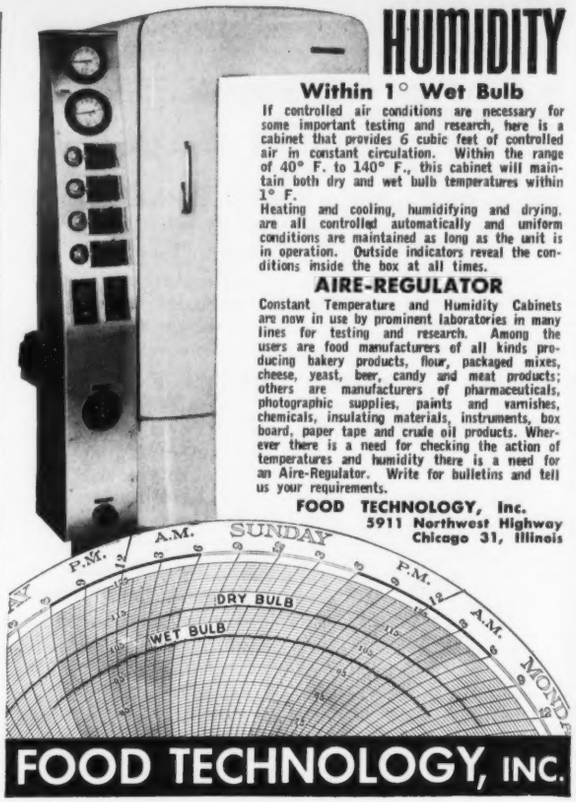
If controlled air conditions are necessary for some important testing and research, here is a cabinet that provides 6 cubic feet of controlled air in constant circulation. Within the range of 40° F. to 140° F., this cabinet will maintain both dry and wet bulb temperatures within 1° F.

Heating and cooling, humidifying and drying, are all controlled automatically and uniform conditions are maintained as long as the unit is in operation. Outside indicators reveal the conditions inside the box at all times.

AIRE-REGULATOR

Constant Temperature and Humidity Cabinets are now in use by prominent laboratories in many lines for testing and research. Among the users are food manufacturers of all kinds producing bakery products, flour, packaged mixes, cheese, yeast, beer, candy and meat products; others are manufacturers of pharmaceuticals, photographic supplies, paints and varnishes, chemicals, insulating materials, instruments, box board, paper tape and crude oil products. Wherever there is a need for checking the action of temperatures and humidity there is a need for an Aire-Regulator. Write for bulletins and tell us your requirements.

FOOD TECHNOLOGY, Inc.
5911 Northwest Highway
Chicago 31, Illinois

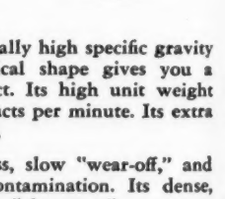


FOOD TECHNOLOGY, INC.

When inquiring check CP 2420 on handy form, pgs. 2-3

100% FASTER THAN OTHER GRINDING MEDIA!

BURUNDUM



If you want the same grind in half the time or a much finer grind in the same time, you want BURUNDUM — the tubular grinding medium!

BURUNDUM is a tough, white, ultra-high fired ceramic medium of unusually high specific gravity and extreme hardness. Its cylindrical shape gives you a greater area of attrition per contact. Its high unit weight gives you faster action — more contacts per minute. Its extra hardness gives you positive grinding.

What's more, BURUNDUM's toughness, slow "wear-off," and light color make for minimum contamination. Its dense, non-porous surface permits fast, easy "clean-ups."

User after user is finding BURUNDUM gives much faster — much finer grinds than flint pebbles or porcelain balls. Why don't you? *Write, today, for full details and samples.*

396C

THE U. S. STONEWARE CO.
AKRON 9, OHIO
Process Equipment Division

When inquiring check CP 2421 on handy form, pgs. 2-3

Tests larger sample for fungus, making longer test runs economical . . .

thermostat-controlled immersion heaters permit various conditions to be held during test

In order to meet US Air Force Specification MIL-E-5272 in testing materials and equipment for fungus proofing, a unit with controlled heat and humidity has been built. Among the advantages of this cabinet are its large size, (working space of 2 x 2½ x 6 feet) controlled heating,

2 x 2½ x 6 feet inside

and corrosion-resistant construction. Larger size permits more samples to be run at the same time so that longer runs can be allowed without any danger of overloading equipment.

Constructed of stainless steel, the cabinet has heaters beneath the floor baffles. Indicating-controlling thermostat is mounted in the front with controls, pilot lights, and instrument panel.

(Announced by Bowser Technical Refrigeration Division, Dept. CP, Terryville, Conn. . . . or for more information check CP 2422 on handy form, pages 2 and 3.)

Measures changes of 0.0002 μ in aerosol particle's radius

Seventeen-page report describes development to measure size of aerosol particles. Instrument was developed out of need for accurate measurement of aerosol particles in study of smoke filters. Working principle of unit is that particles change the angle of polarization of a beam of light going through air. Optical device previously used was equipped with electronic arrangement of phototubes and amplifier to increase sensitivity. Instrument detects changes of 0.0002 micron in aerosol particle's radius.

Chemical and metallurgical industries may utilize this development in further study of colloids. Practical applications would relate to industries using finely divided particles as catalysts, raw material, or other media in chemical processing. To obtain PB 105 181, remit 50c direct to Office of Technical Services, U.S. Department of Commerce, Washington 25, D.C.

RIGHT IN YOUR OWN BACK YARD . . . BY WEST
TO HEAR DIEHARD TELL IT, NO INSECTICIDE COULD DO THE JOB IN HIS PLANT··· UNTIL···YOU GUESSED IT··· HE TRIED "DOUBLE PENETRATION!"
SNA-FOOD KOMPANY
HEY, BOSS, HAVEN'T FOUND A TRACE OF WILD LIFE SINCE LAST WEEKS FOGGING WITH VAPOSECTOR!
H'MM! I'M BUGS, IF VAPOSECTOR DOESN'T DO THE TRICK!
HERE'S THE COST SHEET, BOSS··· 12,000 CUBIC FT. HERE···SO IT ONLY COST US A BUCK TO FOG THIS WHOLE DEPARTMENT WITH OUR WEST ATOMIZERS!
THEM'S NOT BUGS··· THEY'RE POPPY SEEDS FROM SOMEBODY'S LUNCH-BOX
WHY TEAR UP THE FLOORBOARDS? I CAN'T EVEN HEAR A FADING HEART-BEAT!
REMEMBER THE FIRST VAPOSECTOR DEMONSTRATION? IT POSITIVELY RAINED INSECTS!
I WAS ITCHING TO TELL YOU THAT!
NO SMELL, NO STAIN, NO AFTERTASTE··· VAPOSECTOR QUALIFIES HERE, CHIEF!

DIEHARD'S CASE ISN'T SO UNUSUAL AFTER ALL! In all types of industry West representatives hear comments like "our situation is a special one" . . . "an insecticide is bound to impair the quality of our product" . . . and – stranger still – "we don't have any insect problem here!"

VAPOSECTOR was formulated for the realist who *has* an insect problem and wants to get rid of it – fast! It's fully three times as concentrated as the standard Grade AA spray . . . yet there's no danger of contamination or odor when used according to directions. Vaposector controls insects by "double penetration". When used with West spraying equipment, it becomes a "dry fog" that *penetrates* the most remote crevice . . . then *penetrates* the insect's outer covering for a permanent kill. There's no place to hide. No time to escape. A Vaposector demonstration has often revealed dead insects in numbers never thought possible – simply because they live and multiply in unseen cracks and crevices.

VAPOSECTOR gives more positive control value per gallon than any competitive product. It breaks down into such minute droplets when atomized with specially-designed West equipment, that only one ounce is needed to control flying insects in 1000 cubic feet . . . only two ounces for crawling insects. Compare it with an ordinary mill spray and you'll find Vaposector is over *four times as economical in use!* West can supply Vaposector as well as special mill sprays and fumigants . . . residual and contact insecticides . . . spraying equipment – a *complete insect control program* tailored to your exact needs!

WEST DISINFECTING Company

42-16 West Street
Long Island City 1, N. Y.

ASK FOR FURTHER INFORMATION ON HOW TO CONTROL INSECTS BY "DOUBLE-PENETRATION"

Dept. 45

☐ Please send Vaposector booklet.

Please send information on specially-designed permanent ☐, portable ☐, hand spraying ☐ equipment

Name_____ Title_____

Company_____

Address_____

City_____ Zone_____ State_____

When inquiring check CP 2423 on handy form, pgs. 2-3

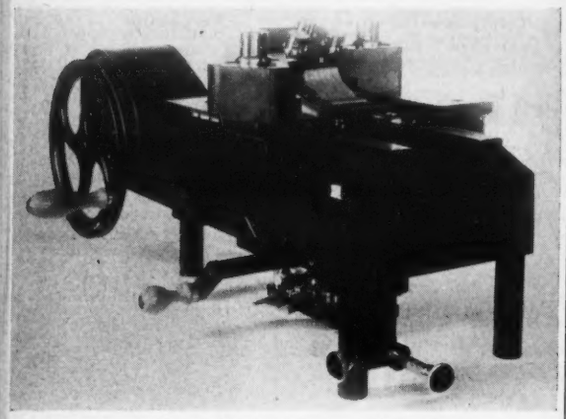
Slices opaque materials into four-micron sections . . .

microtome makes it possible to observe metals, wood, plastics, other materials with transmitted light

Uses: Preparing very thin specimens of known thickness for microscopic examination. Instrument will slice plastics, pressed material, all kinds of wood including plywood, soft rubber materials, and metals.

Features: Slices can be made as thin as four microns. They can be automatically set for other thicknesses in steps of two microns.

Description: Model K Microtome is a precision instrument built in Germany. It is equipped with a variety of knives for cutting materials of various hardness and also has a freezing chamber to facilitate cutting of soft material like rubber. It can hold objects slightly larger than 3 x 2 inches (80 x 55 mm). Base of the instrument is about 32 x 16 inches.



Slice thickness adjustable in steps of two microns

(Instrument is available through William J. Hacker & Co., Inc., Dept. CP, 82 Beaver St., New York 5, N.Y. — delivery is currently running three to five months . . . or for more information check CP 2424 on handy form, pages 2 and 3.)

Can deliver liquid volume as small as 0.001 ml in wide viscosity range . . .

without interrupting flow, volume delivery is instantly interchangeable via vernier control

Uses: Can be applied to many laboratory procedures requiring accurately metered deliveries of small liquid volumes, as in titrations, micro-injections, perfusions, and other operations.

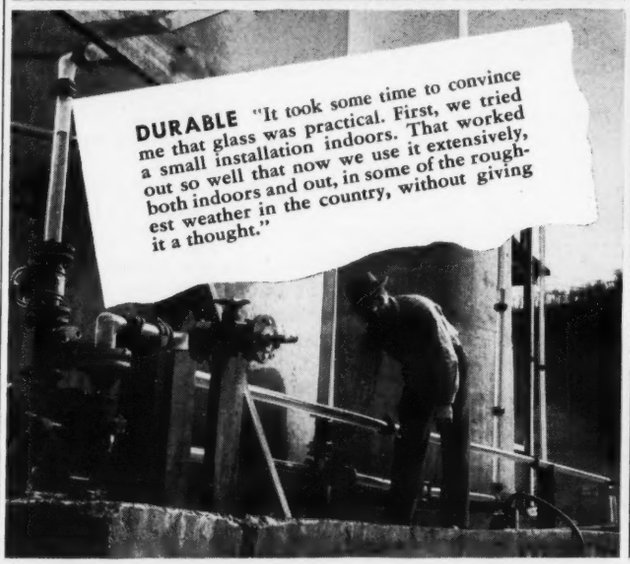
Features: Volume delivery is instantly interchangeable during operation by adjusting vernier control. Under identical conditions, pump will deliver identical volumes at the same setting. Handles liquids with wide viscosity range.

Description: Technicon Micro Pump is available with two chambers for different volume deliveries: "A" delivers from 0.001 to 0.1 ml per stroke, and "B" delivers from 0.01 to 1 ml per stroke. The chambers can be interchanged simply by lifting out and replacing. Vernier scale is linear so that the exact amount being pumped can be read directly off the scale at any given

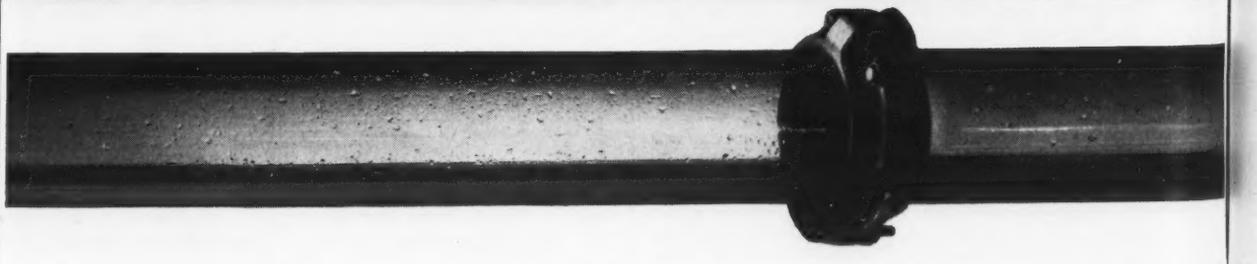
Why more chemical processors

CORROSION-RESISTANT "Glass is the most corrosion-resistant material I know. Our PYREX pipelines show no effects after months of running hot acids through them."

NON CONTAMINATING "We're handling a highly sensitive product. Even the slightest contamination would ruin an entire batch. We had to be sure we were using an absolutely safe piping material. That's why we chose PYREX brand glass pipe."


DURABLE "It took some time to convince me that glass was practical. First, we tried a small installation indoors. That worked out so well that now we use it extensively, both indoors and out, in some of the roughest weather in the country, without giving it a thought."

TRANSPARENT "Being able to watch the flow was what sold us . . . and believe me, it has paid off. There's been more than one occasion where we've seen trouble brewing and shut off the flow, saving a whole batch."



sare switching to PYREX® brand "DOUBLE-TOUGH" Glass Pipe

Here are 6 reasons why chemical engineers and processors who have had experience with PYREX brand "Double-Tough" glass pipe recommend it to you:

1. Highly resistant to corrosion, physical and thermal shock, PYREX pipe lasts longer . . . assures fewer production shutdowns, lower maintenance and replacement costs.

2. PYREX brand glass pipe is noncontaminating—protects even the most sensitive solutions.

3. Trouble can't hide behind transparent glass pipe. And its smooth surface makes cleaning easy. It can be sterilized with steam.

4. Costs less per foot installed than any other corrosion-resistant piping material.

5. Easy to install and plumb, your own plant help can put in your PYREX pipe installation.

6. PYREX brand "Double-Tough" glass pipe is available now in diameters of 1″, 1½″, 2″, 3″, 4″ and 6″ I.D. in standard lengths up to 10 feet. Fittings include 45° and 90° elbows, tees, reducers and crosses. Plug valves are available in 1″ and 1½″ sizes. For the complete story, check and mail the coupon . . . or contact the PYREX brand glass pipe distributor nearest you:

ALBANY 5, NEW YORK
A. J. Eckert Company

BELMONT, CALIFORNIA
Glass Engineering Laboratories

CAMBRIDGE 39, MASS.
Macalaster Bicknell Company

CHICAGO 44, ILLINOIS
Fred S. Hickey, Inc.

FRESNO 17, CALIFORNIA
Valley Fdy. & Mach. Works

HATBORO, PENNSYLVANIA
Sentinel Glass Company

ROCHESTER 3, NEW YORK
Will Corporation

HOUSTON 7, TEXAS
W. H. Curtin Company

PITTSBURGH, PA.
Fisher Scientific Company

MONTREAL 3, QUEBEC, CAN.
Fisher Scientific Company

SEATTLE 4, WASHINGTON
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ST. LOUIS 2, MISSOURI
Stemmerich Supply Inc.

LODI, NEW JERSEY
Mooney Bros. Corp.

BUFFALO, NEW YORK
Buffalo Apparatus

OTHER PYREX brand GLASS PRODUCTS FOR THE PROCESS INDUSTRIES

PYREX brand Glass Fractionating Columns Offer:

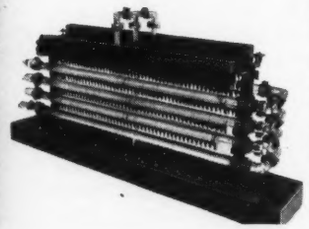
Uniform quality of distillate through elimination of product contamination.

Longer service life because of exceptional resistance to acid corrosion.

High efficiency with a wide range of solvents plus complete visual check on performance.

Sizes: 4″, 6″, 12″ and 18″ diameters. Available now at reasonable cost.

PYREX brand GLASS CASCADE COOLERS GIVE YOU:



Low first cost per BTU transferred besides increased economy through long service life.

Unusual versatility of mounting on floor, wall or ceiling to save valuable space.

Maximum heat transfer through thin but sturdy walls.

Available now at reasonable cost. Check and mail the coupon.

CORNING GLASS WORKS, CORNING, N. Y.

Corning means research in Glass

VISIT THE NEW CORNING GLASS CENTER

CORNING GLASS WORKS

Dept. CP-5, Corning, N. Y.

Please send me the printed information checked below:

- ☐ "PYREX brand Glass Pipe in the Process Industries" (EA-1)
- ☐ "PYREX brand "Double-Tough" Glass Pipe and Fittings" (EA-3)
- ☐ "Plant Equipment Glassware for Process Industries" (EB-1)
- ☐ "Installation Manual" for PYREX brand "Double-Tough" Glass Pipe (PE-3)
- ☐ "PYREX Cascade Coolers" (PE-8)

Name_____

Title_____

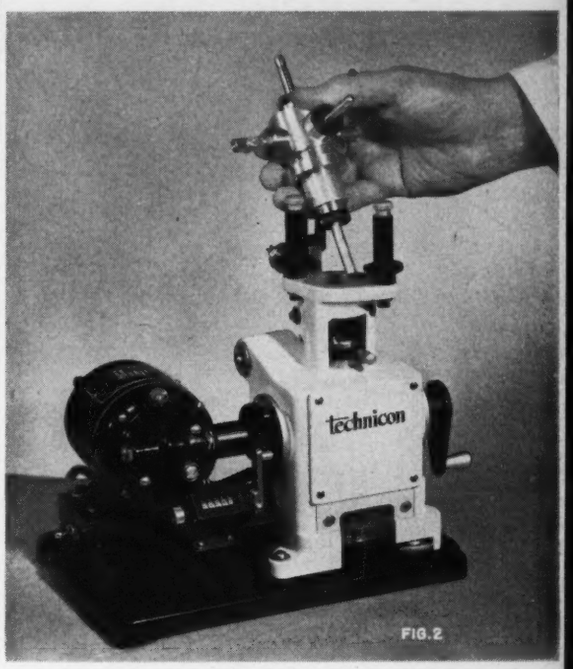
Company_____

Street_____

City_____

Zone_____ State_____

When inquiring check CP 2425 on handy form, pgs. 2-3



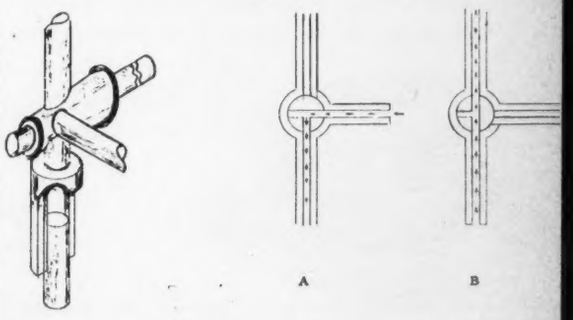
Removing delivery chamber. Micrometric vernier scale beneath name-plate

point; calibration is in increments of 0.001 ml with vernier control to 0.0001 ml.

A counter — seen mounted close to motor in accompanying photo of pump — registers the delivery strokes so that total volume delivered can be easily determined.

Interchangeable synchronous motors give pumping speeds of 2, 10, 25, and 30 strokes per min. Pump is equipped with a crank for very slow, manual operation.

The drawings show how the Micro Pump operates. For delivery of 0.001 ml, the necessary piston travel is precisely governed by making this setting on the micro-

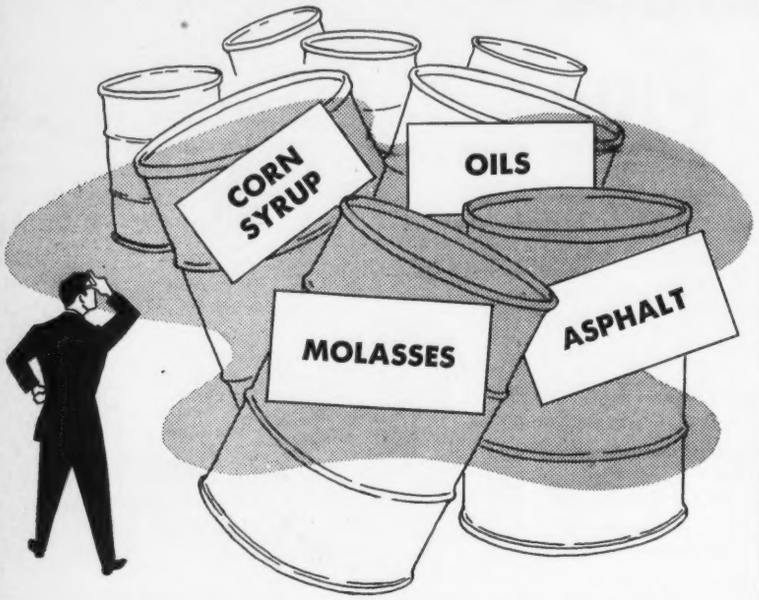


metric vernier scale. On the intake stroke, the precision ground, three-way cock rotates to position "A". On delivery stroke it rotates to position "B". The pump assembly is separate from the drive system and can be quickly removed and taken apart in about a minute for cleaning or sterilizing.

Units may be obtained with either glass or stainless steel (Carpenter type 20) pump parts.

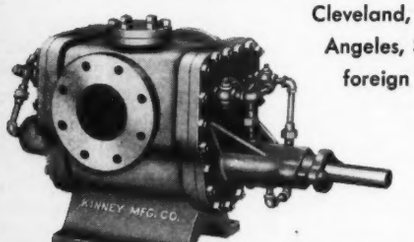
(Manufactured by Technicon Chromatography Corp., Dept. CP, 215 East 149th St., New York 51, N. Y. . . . or for more information check CP 2426 on handy form, pages 2 and 3.)

How would you PUMP it?



Viscous pumping jobs like these call for a Kinney SD Rotating Plunger Pump — the pump that steps in where other pumps fail. The pumping mechanism is extremely efficient, capable of handling virtually any viscous material which can be pumped through a pipeline. The unique Kinney design eliminates valves, blades, springs, vanes, and internal obstructions. Flow through the pump is steady and smooth — so reliable this pump can be used as a combined meter and pump.

Kinney SD Rotating Plunger Pump has revolutionized the handling of viscous materials in many industries. Perhaps it can open the way to new economies in your plant. Write or send coupon for details and recommendations. Kinney Manufacturing Co., Boston 30, Mass. Representatives in New York, Philadelphia, Chicago, Cleveland, Houston, New Orleans, Los Angeles, San Francisco, Seattle, and foreign countries.



Kinney LIQUID PUMPS

KINNEY MANUFACTURING COMPANY
3573 Washington St., Boston 30, Mass.

Please send me Bulletin L51 describing Kinney Liquid Pumps.
My liquid pumping problem involves:

☐ Acid Sludge	☐ Crude Oil	☐ Fuel Oils	☐ Road Oil
☐ Asphalt	☐ Cylinder Stock	☐ Grease	☐ Soap, Glycerine
☐ Chocolate	☐ Lube Oils	☐ Molasses	☐ Others (see letter attached)
☐ Corn Syrup	☐ Edible Oils	☐ Paint, Enamel	

Name..... Company.....

Address.....

When inquiring check CP 2427 on handy form, pgs. 2-3

FOR THE LABORATORY

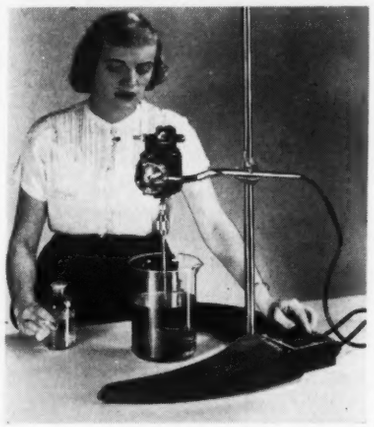
Three separate shafts select speed range of stirrer . . .

rheostat control allows fine adjustment within ranges

Uses: Laboratory mixing and stirring.

Features: Motor shaft is geared to two other shafts to provide top speeds of 140, 825, and 5000 rpm. Rheostat control allows adjustment of speed within these ranges.

Description: Versatile Stirrer is designed to handle all types of light laboratory stirring. Employing a universal motor, it operates on either AC or DC. Large crescent-shaped



Speeds to 5000 rpm

base allows vessels up to 15-inch in diameter to be accommodated. Rheostat control can be moved to any desired location, but there is a special niche for it at the rear of the support base.

In order to make its versatility available for all laboratory jobs, the stirrer is equipped with a universal chuck which holds rods, special shapes up to 5/16-inch diameter.

Cast base weighs 17 pounds and the ¾-inch plated steel upright stands 28 inches high.

(Product of Fisher Scientific Co., Dept. CP, 717 Forbes St., Pittsburgh 19, Pa. . . . or for more information check CP 2428 on handy form, pages 2 and 3.)

Readers of CHEMICAL PROCESSING are invited to submit concise briefs of their processing problems. With your permission these will be published (anonymously, if desired). We will place you in contact with any of the 33,000 people receiving CP who offer a solution.

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STOP WASTING COSTLY TIME AND ENERGY LOOKING FOR LOST BLUEPRINTS!

No Wrinkles!

No Creases!

No Curled Edges!

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- Maps
- Charts
- Plans

DRAW-IN-DEX CABINET protects your valuable prints—keeps them in excellent condition. You find them immediately when you need them. Efficient filing.
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- **Index file locates your prints instantly.**
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Heavy steel construction; with lock; variety of colors.
$139.50 F.O.B. Huntsville, Alabama. Write for full information.

EMPIRE DEVELOPMENT CORPORATION
Dept. 4 **15 Park Row, New York 38, N. Y.**

When inquiring check CP 2429 on handy form, pgs. 2-3

Now you can SPRAY DRY in laboratory or pilot plant quantities

The Swenson Research Spray Dryer provides instant drying at low temperature, with close control of moisture in the finished product. Ideal for use in developing new products and new processes. Write for Bul. D-106.

SWENSON EVAPORATOR CO.
Division of Whiting Corporation
15667 Lathrop Ave. Harvey, Illinois

When inquiring check CP 2430 on handy form, pgs. 2-3

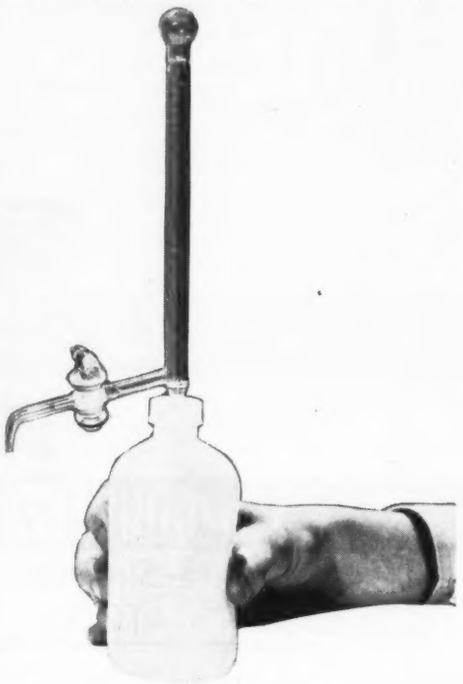
Polyethylene delivery tube adds to durability of buret . . .

press-to-fill buret has polyethylene reservoir; comes in ten and twenty-five milliliter sizes

Uses: Repetitive titrations using the same reagents — standard acids, alkalis, etc.

Features: Polyethylene reservoir allows filling the buret by gently squeezing. A polyethylene delivery tube prevents breakage at the joint of glass and plastic.

Description: Royalton Press-O-Matic Buret is available in 10 and 25 milliliter sizes. Complete as shown, it consists of polyethylene reservoir, automatic zeroing



Simply squeeze to fill

buret with fused-in glass stopcock, and a polyethylene delivery tube. Polyethylene is chemically resistant to a wide assortment of reagents and solvents.

(Product of Meyer Scientific Supply Co., Inc., Dept. CP, 215 N. 8th St., Brooklyn 11, N. Y. . . . or for more information check CP 2431 on handy form, pages 2 & 3.)

1000 organic chemicals compose laboratory price list

Over 1000 organic laboratory chemicals for industrial use are listed in 24-page price list. Three grades of organic chemicals are offered: Reagent, which is highest purity; Practical, which is purified material; and Technical, which is commercial grade. Chemicals are packed in metric units, and items ordered in avoirdupois units are filled in nearest metric equivalent. In addition to price listing and shipping quantities, catalog includes information as to boiling and melting points of various compounds.

"Organic Laboratory Chemicals" is issued by Eastern Chemical Corporation, Dept. CP, 34 Spring St., Newark 2, N. J. When inquiring specify CP 2432 on handy form, pages 2 and 3.

How porous *do you want your* catalyst supports?

Norton catalyst supports come in two types:

1. If your process calls for coated catalyst supports, you get what you want from Norton medium-porosity spheres. They have a porosity of 30-35%, with a rough, open surface structure. This gives you maximum adherence of catalyst to surface.

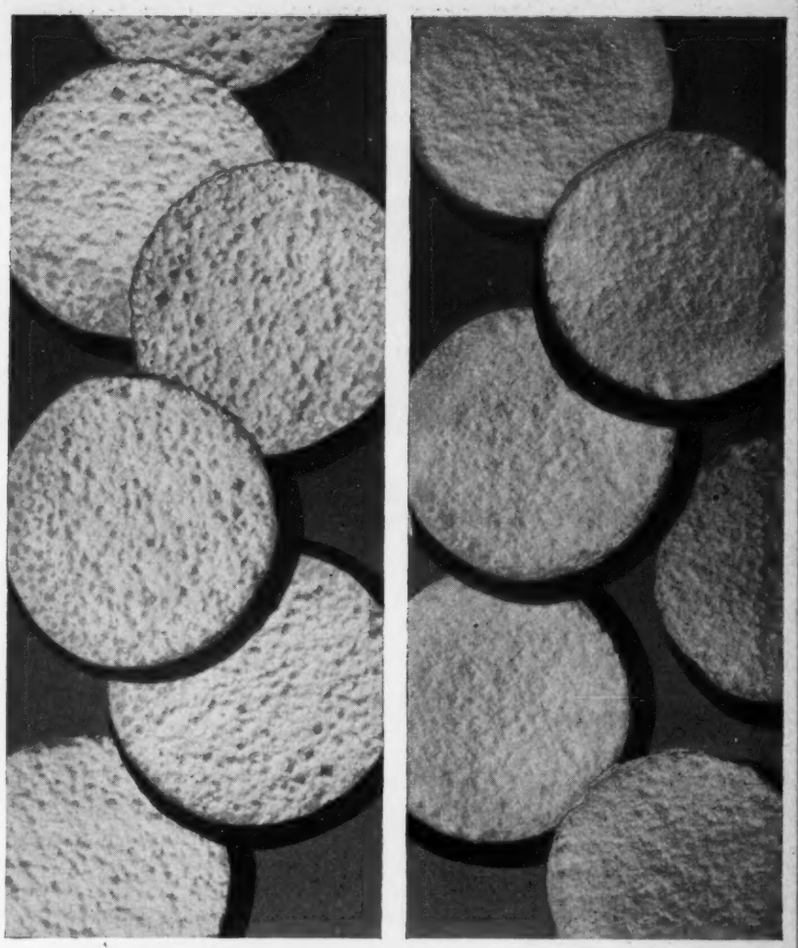
2. If you need supports for impregnation, Norton high-porosity spheres are your choice. Their porosity is 42-47% with large, connected, internal pores uniformly dispersed throughout the support. This gives you maximum deposition of catalyst.

You also have a choice of sizes and shapes. Norton spheres are available in diameters of 3/16" to 1". Other Norton catalyst supports, in ring and pellet form, available in diameters of 1/8" to 2".

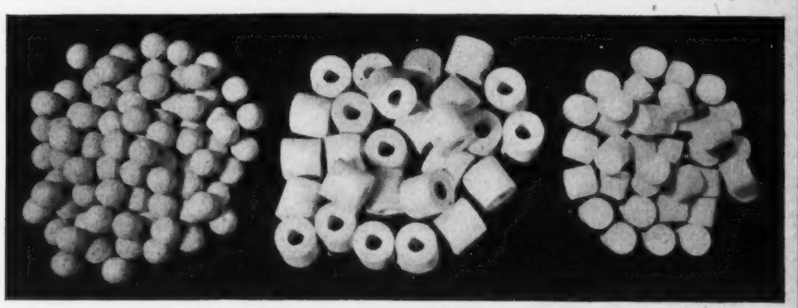
A choice of materials, too. Norton catalyst supports can be made from a variety of refractory materials, offering many different combinations of properties.

Test them in action

You can easily prove, in your own plant, what Norton catalyst supports can do towards improving your production. Want to see samples? Contact your Norton representative or write direct to Norton Company, 562 New Bond Street, Worcester 6, Mass. *Canadian Representative:* A. P. Green Fire Brick Co., Ltd., Toronto, Ont.



Greatly enlarged views of cross-sections of the two types of Norton catalyst support spheres. *Left: Norton High-Porosity Spheres* have connected pores throughout. *Right: Norton Medium-Porosity Spheres* have pores close to surface. You can also get Norton Low-Porosity Spheres if required.



Norton catalyst supports are made in sphere, ring, and pellet form.

NORTON HEAT EXCHANGE PEBBLES also offer you worthwhile advantages, especially where alternating oxidizing and reducing atmospheres are met. They're made of ALUNDUM* electrically fused alumina (alumina content 95% to 99%). Nothing like them for static or moving heat exchange beds.

*Trade-Mark Reg. U. S. Pat. Off. and Foreign Countries

NORTON

Special REFRACTORIES

Making better products to make other products better

NORTON COMPANY, WORCESTER 6, MASSACHUSETTS

When inquiring check CP 2433 on handy form, pgs. 2-3

for valving corrosive and "hard-to-handle" fluids . . .

HILLS-McCANNA

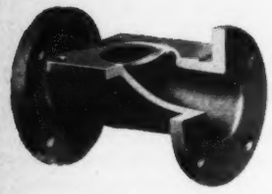
offers over 20,000 different "custom-made" assemblies on a standardized basis

32 standard operators

Methods of operation for Hills-McCanna Valves include handwheel and lever operators, sliding stem, air and hydraulic cylinders, diaphragm motors and electric motors in a variety of types.

14 standard diaphragms

Diaphragms, the heart of Hills-McCanna Valves, are offered in the widest choice to best suit your individual needs; 5 types of rubber, 3 of Neoprene plus Hycar, butyl, Tygon, Compar, special polyethylene and Kel-F.



48 standard body materials

Bodies for Hills-McCanna valves are furnished in cast iron, with or without such linings as rubber, glass, lead, etc.; in any machinable alloy or in such materials as Karbate, stoneware, porcelain, etc.

By offering such a broad selection of operators, diaphragms and bodies, Hills-McCanna is able to furnish so many standard combinations that the user is in the position of being able, in most cases, to find the exact valve that best fits his individual requirements. There is virtually never any need to adapt to your service a valve developed for someone else's needs.

The 36 page catalog No. V-52 gives full details on all Hills-McCanna Valves. Write for your copy. HILLS-McCANNA CO., 2370 W. Nelson St., Chicago 18, Illinois.

HILLS-McCANNA

saunders patent diaphragm valves

Also Manufacturers of Proportioning Pumps
Force Feed Lubricators • Magnesium Alloy Castings

When inquiring check CP 2434 on handy form, pgs. 2-3

FOR THE LABORATORY

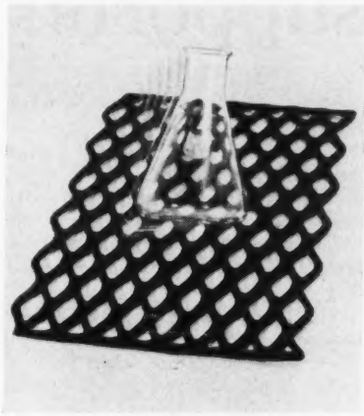
Beakers bounce instead of busting . . .

resilient mat won't crack or harden even in sloppy sink bottoms

Uses: Reduces breakage in washing and handling fragile lab glassware, thermometers, etc.

Features: Open-mesh mat is easy-to-clean, can be used in wet or sloppy locations, like sink bottoms without hardening or cracking.

Description: "Beaker Bouncers" are open steel meshes coated with Akrolite, a chemically resistant material. Stock sizes include 12 x 8", 20 x 12", 22 x 12", 26 x 14", and 30 x 15". Special sizes are made to order.



Five stock sizes available

(Distributed by Meinecke & Company, Inc., Dept. CP, 225 Varick St., New York 14, N. Y. . . . or for more information check CP 2435 on handy form, pages 2 and 3.)

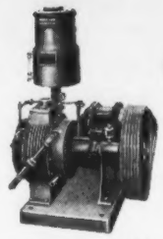
Reviews techniques in measuring colloids

Government research report describes and compares present methods of determining surface area and size of finely divided (powdered) materials.

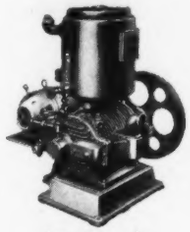
According to report, a new technique ("fatty acid adsorption") for surface area measurement is presented.

Because of short time required for method, report says it can be used for control of chemical processes.

Information is slanted to guide chemists and engineers in designing processes and machinery for using finely divided materials. Photos, drawings, graphs, and tables are included in 72-page report. To obtain PB 104 372, remit $10 (photostat) or $3.50 (microfilm) to Photoduplication Service, Publication Board Project, Library of Congress, Washington 25, D.C.



Type SS . . . for vacuum up to 5mm on tight systems, for dry or semi-wet work. Capacities 6 to 375 c.f.m.



Type RP . . . for vacuum up to 10 microns or better on dry or wet work. Capacities 17 to 845 c.f.m.

For All Vacuum Requirements in Process or Lab

Up to 10 Microns or Better...

BEACH-RUSS ROTARY VACUUM PUMPS

- **Faster Pump Down**
- **Superior Mechanical Efficiency**
- **Longer, More Dependable Service**

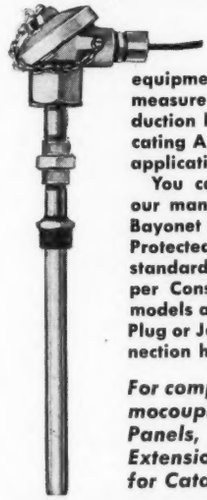
Ask us to put your name on the mailing list for "Much Ado About Nothing"... the Beach-Russ house organ that keeps its readers posted on the latest developments in vacuum processes.

BEACH-RUSS COMPANY
46 CHURCH STREET • NEW YORK 7, N. Y.

When inquiring check CP 2436 on handy form, pgs. 2-3

Thermo-COUPLES

Special YESTERDAY	Standard TODAY



Many of our specially designed thermocouples are now standard equipment and are being used constantly to measure operating temperatures in the production line or pilot plants; on Jet or Reciprocating Aircraft Engines; on regular or unusual applications.

You can easily select thermocouples from our many standard types—Wire or Tubular—Bayonet Immersion Contact—Exposed Loop—Protected—Straight or Angle. Available in all standard calibrations for Iron Constantan, Copper Constantan and Chromel Alumel. Many models are equipped with our Quick Coupling Plug or Jack Connectors or screw fastened connection heads.

For complete information about our Thermocouples, Quick Coupling Connectors, Panels, Pyrometers, Thermocouples and Extension Wires and Accessories, write for Catalog. R.

Thermo Electric Co., Inc.
FAIR LAWN NEW JERSEY

When inquiring check CP 2437 on handy form, pgs. 2-3

Temperature of circulating air governs its rate through heating elements . . .

thermostatic element retards air recirculation while temperature is low, increases flow as air gets hot

Uses: For laboratory or production use where a forced-circulation oven is indicated. Temperature range is 35 to 288°C (95 to 550°F).

Features: Recirculating system of oven governs air flow according to temperature — as air gets hotter, system permits greater flow.

Description: Con-Wate Ovens are forced circulation ovens featuring constant air weight circulation. This is done by the combination of a thermostatic damper valve and an oversize blower wheel. Larger wheel has increased capacity at higher temperatures where air is lighter. Air circulation is monitored by a small rotameter. Other controls and indicators are provided for heater wattage and preheating.

Temperatures to 550°F

Inside dimensions of the ovens range from 20 x 18 x 20 inches to 48 x 24 x 36 inches. Maximum wattage from 4400 to 8500 watts. All ovens are designed for 230v single-phase power.

(Manufactured by Blue M Electric Company, Dept. CP, 306-08 W. 69th St., Chicago 21, Ill. . . . or for more information check CP 2438 on handy form, pages 2 & 3.)

Illustrates variable transformer for 50, 100, and 150w

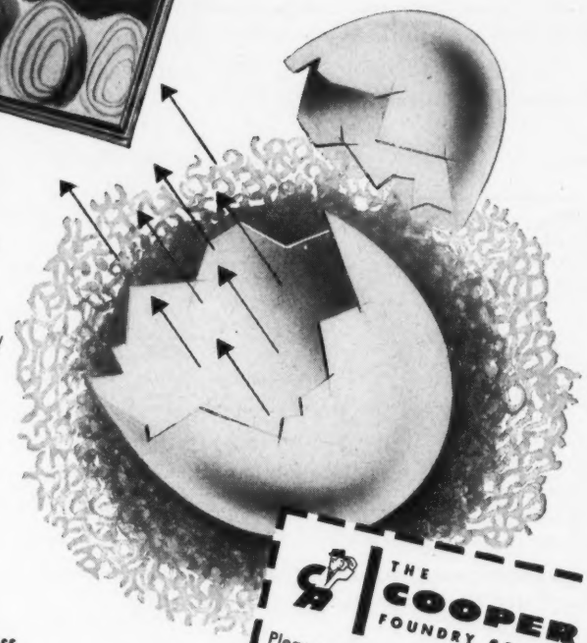
Four-page bulletin describes variable transformer to solve AC voltage problems involving 50, 100, and 150w. Sectional illustrations outline dimensions of transformer.

Two-color bulletin stresses efficiency of unit in contrast to heat-dissipating resistance type controls. Transformer is tapped to allow output voltage range from zero to line voltage or to 10% above line voltage. Unit does not have to be tailored to load, but delivers variable voltage to any load up to its rated capacity.

Bulletin concludes with brief review of other voltage control equipment. Instruments described are AC and DC power supply units and automatic voltage regulators. Bul P252 is issued by The Superior Electric Company, Dept. CP, Bristol, Conn. When inquiring specify CP 2439 on handy form, pages 2 and 3.

Hey kids...it's hatched

Just about the time
we thought it would never see the light of day
it cracked the shell wide open



We're mighty proud of this
28 page full color industrial fantasy,
And we've got an idea that
you and your family are in for a very
pleasant surprise.
Told with a richness and warmth
that people of all ages
will enjoy . . . Alloys In Cooperland
captures the spirit of
Lewis Carroll in describing how stainless
steel castings are made.

THE COOPER ALLOY FOUNDRY CO. HILLSIDE, NEW JERSEY

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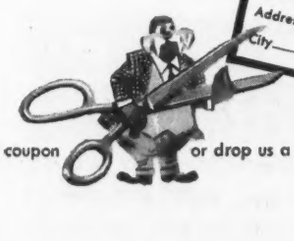
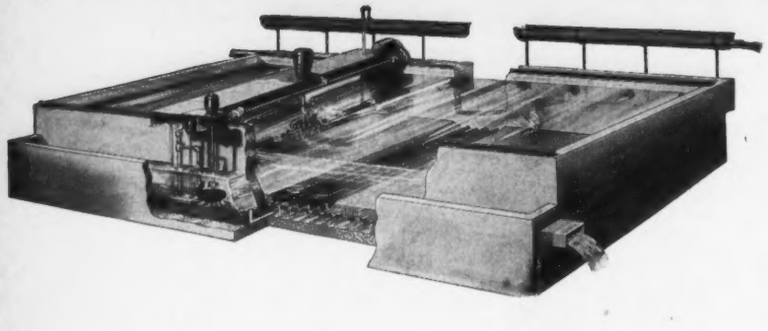


For your COMPLIMENTARY COPY, clip the coupon or drop us a note on your letterhead.

When inquiring check CP 2440 on handy form, pgs. 2-3



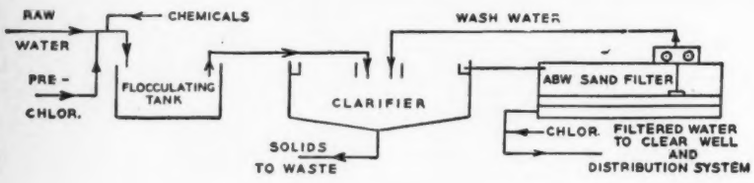
It *CLEANS ITSELF* while filtering!

Hardinge Automatic Backwash Filter

Here is the sanitary engineer's dream come true! . . . a sand filter which cleans itself — automatically — with no interruption whatever to the filtering operation. No shutdown or change-over is necessary while cleaning is in progress.

The secret of this remarkable filter lies in its special, compartmented filter bed and traveling backwash mechanism which automatically cleans and removes the sludge from one compartment at a time — on a pre-determined time cycle or with increase in head pressure.

And . . . it's highly efficient, removing 75% to 80% of the suspended solids — 90% or better if chemicals are added.



The Hardinge Automatic Backwash Rapid Sand Filter has proven highly satisfactory on industrial as well as municipal water supply systems. In the town of Newton Falls, N. Y., for example, a single Hardinge ABW filter handles both the industrial water supply for the Newton Falls Paper Mill processing operations and the town's water supply. The water produced by this ABW Filter installation contains less than one part per million of suspended solids in spite of the fact there is no flocculation or pre-sedimentation before filtering.

BULLETIN 46-13.

HARDINGE
COMPANY, INCORPORATED

YORK, PENNSYLVANIA—240 Arch St. Main Office and Works

NEW YORK 17 • SAN FRANCISCO 11 • CHICAGO 6 • HIBBING, MINN. • TORONTO 1
122 E. 42nd St. 24 California St. 205 W. Wacker Dr. 2016 First Ave. 200 Bay St.

When inquiring check CP 2441 on handy form, pgs. 2-3

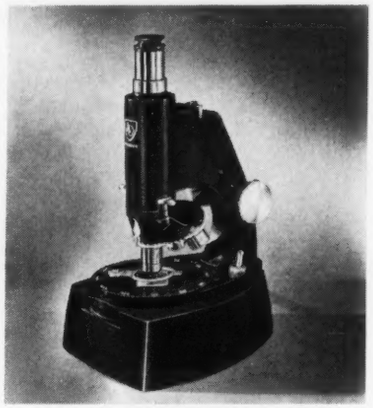
FOR THE LABORATORY

Observer can rest arms while using redesigned microscope . . .

enclosed sub-stage, "reverse" design make use easier

Functional design of this polarizing microscope makes it easy to use in crystallography, chemical microscopy, and petrography. Optical performance of this model (the P45) is reported to be excellent to full power of 430X.

Completely enclosed sub-stage contains a permanently aligned illuminator. Apertures up to 0.66 may be used with it. Polarizing disc is mounted just below the stage and has a heat absorbent shield between it and the illumination. Angle measurements of the polarizer can be estimated to one degree and a ring-type stage clip permits 45 and 75 mm slide to be used. Not only does the "reverse" position permit a clearer view of the stage, specimen, objectives, and adjustments, but the position of the adjusting knobs — away from the observer — permits resting hands and forearms comfortably on the table top.



Observer sits in front of, rather than behind, this microscope

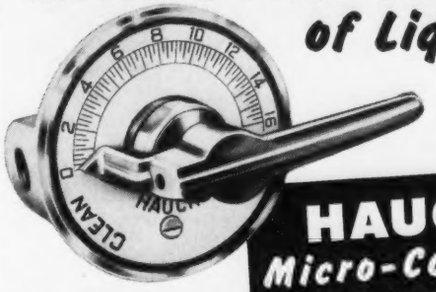
Various designs can be furnished for double, triple, and quadruple nosepieces. Standard compensating, interference, or measuring attachments can be used.

(Designed and built by Instrument Div., American Optical Company, Dept. CP, Buffalo 15, N. Y. . . . or for more information check CP 2442 on handy form, pages 2 and 3.)

Curves show basic conductivity data

Simple, accurate, and complete presentations of basic electrolytic conductivity is given in this bulletin in a form directly applicable to schools laboratories, and industry. Curves were originally drawn up to fill needs of

Get Straight Line Metered Flow Control of Liquids



HAUCK *Micro-Control* VALVES

Above — Self-clean metering type, lever or hand wheel type, 1/4" and 3/8" pipe size. Below — Micro-cam type, lever or hand wheel type, 1/4" to 1" pipe size.

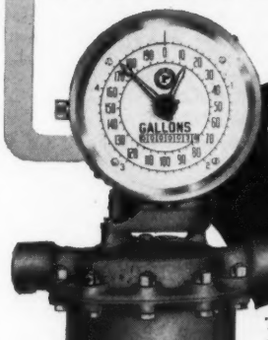
Stop "guesstimating." With Hauck Micro Valves you get visible, positive, speedy, accurate control from full opening to full shut-off. Discharge is directly proportional to setting on calibrated dial. Self-cleaning feature eliminates clogging. Can be operated manually or in automatic control system.

Thousands in use with oil burners, and in pipe lines and processing equipment for vegetable oils, syrups, water, chemicals, etc. Available in steel and corrosion-resistant construction.

HAUCK MANUFACTURING CO.
Industrial Oil and Gas Burners and Equipment
132-142 Tenth Street • Brooklyn 15, New York

When inquiring check CP 2443 on handy form, pgs. 2-3

Get Laboratory Accuracy in Formulas . . . at the *Production Level!* with ROCKWELL *Industrial* METERS



The liquid content in the formula so carefully developed in your laboratory can be exactingly controlled in production when Rockwell meters are assigned to the job. You'll get the highest measurement accuracy while saving materials, labor and money. In addition your accountants will gainfully use the records Rockwell meters provide for inventory and cost control. Write for full details.

Sizes 3/8" to 3" in a variety of suitable materials. Option on type of register. Automatic shut-off control available.

ROCKWELL MANUFACTURING COMPANY
Dept. A3, 400 N. Lexington Ave., Pittsburgh 8, Pa.

When inquiring check CP 2444 on handy form, pgs. 2-3

manufacturer in developing and manufacturing electrolytic conductivity equipment and covers many of the common aqueous electrolytes over wide ranges of concentration and temperature.

Bul 4135D is issued by Industrial Instruments, Inc., Dept. CP, 17 Pollock Ave., Jersey City 5, N. J. When inquiring specify CP 2445 on handy form, pages 2 and 3.

Easy to use and clean — main qualities of metal strainer . . .

non-rusting stand gives solid support to aluminum funnel

Rugged construction and adaptability make this Rein all-metal paint strainer permanent and practical for use in paint laboratories and paint shops. Strainer has an aluminum-coated steel wire stand that supports an aluminum funnel in which a copper-mesh strainer is held firmly in place by a steel wire loop. Durable, well-made and rust-resistant, the strainer will last for many years with reasonable care, manufacturer reports.

Non-rust paint strainer is rugged, easily cleaned

(Distributed by the Gardner Laboratory, Inc., Dept. CP, 4723 Elm St., Bethesda, Md. . . . or for more information check CP 2446 on handy form, pages 2 and 3.)

For more information on product at right, specify CP 2447 . . . see information request blank between pages 2 and 3.

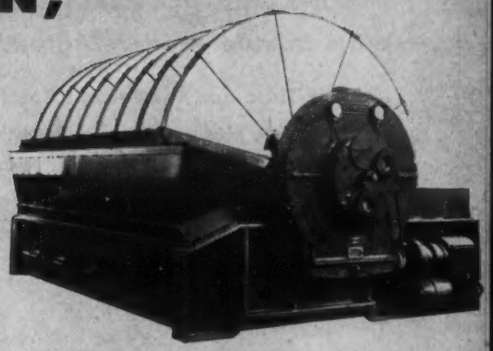
WHEN YOUR PROCESS REQUIRES VACUUM FILTRATION,

Come to EIMCO

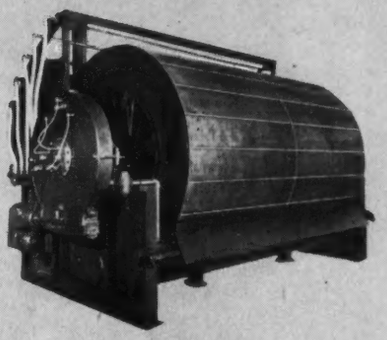
Eimco's experience, obtained by more than half a century of service to the process industries, will help make your vacuum filter fit the needs of your process.

Eimco filters are not built as stock items. They're individually designed and manufactured so as to do a successful job for you in meeting the overall requirements of your flow sheet.

May we send an experienced filtration engineer to talk to you?



EIMCO CONTINUOUS DISC TYPE FILTER



EIMCO CONTINUOUS DRUM TYPE FILTER

EIMCO A363

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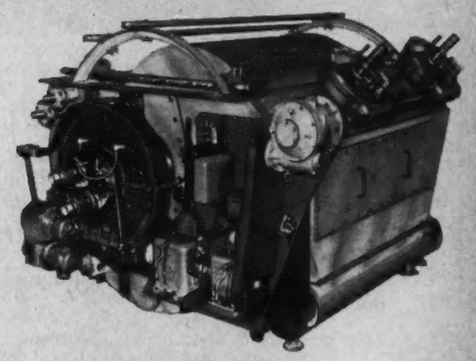
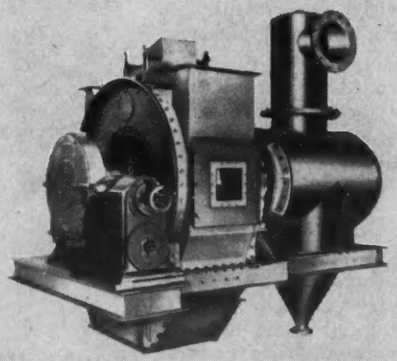
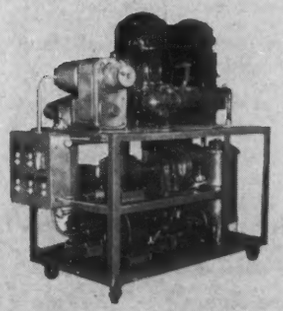
You cant beat an Eimco



EIMCO PRECOAT TYPE FILTER



EIMCO CONTINUOUS DRYER



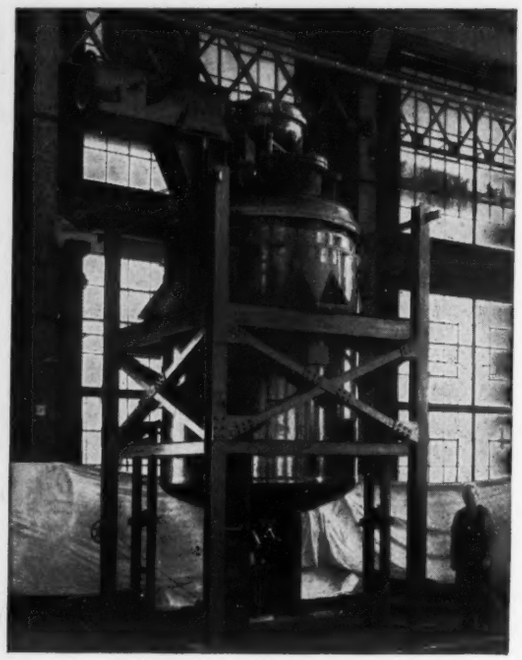
EIMCO LABORATORY TYPE FILTER

BUFLOVAK-DOPP KETTLES

With Double Motion Agitators

SAVE Time and Production Costs

in Processing Heavy Viscous Materials



2750-Gallon BUFLOVAK-DOPP Grease Kettle.

Investigate these BUFLOVAK Features for your processing problem:

* Thorough mixing, freedom from lumps and stratification . . . quickly and efficiently.
* No local overheating.
* Increase of heat transfer rates for rapid heating and cooling cycles.
* Easy and rapid discharge of material.
* Safe, quiet operation.
* Sturdy construction . . . dependable operation . . . low maintenance cost.
* Built in sizes from 1-gal. laboratory units to largest plant size kettles.
* Facilities available for pre-testing operation.

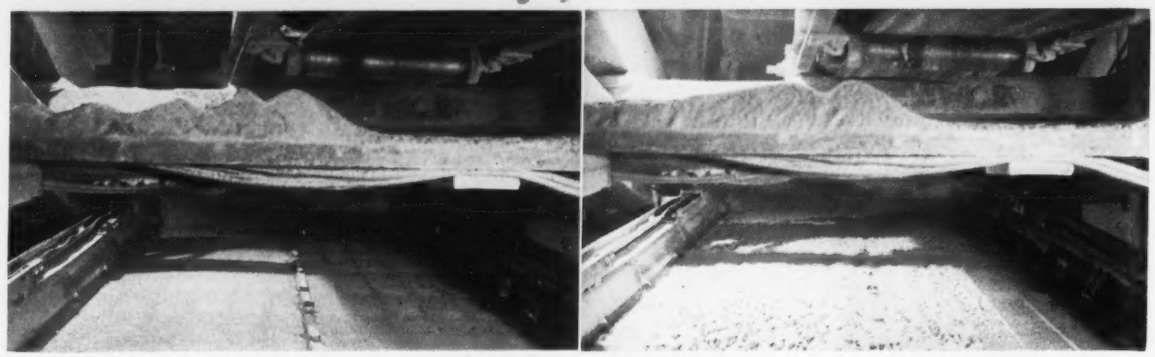
Write for complete information.

BUFLOVAK EQUIPMENT DIVISION

of Blaw-Knox Company

1645 Fillmore Ave. Buffalo 11, N. Y.

When inquiring check CP 2448 on handy form, pgs. 2-3



WITH POWER ON WITH POWER OFF

Advantage of using heating unit on vibrating screen is obvious by comparing these two views of the same screen, one while heater is operating, the other while it is off. This is a 5 by 14 single-deck Ripl-Flo vibrating screen handling pulverized limestone. Screen cloth is 6 mesh, 0.047 diam wire

Heated Vibrating Screen Has Higher Capacity, Lasts Three Times as Long

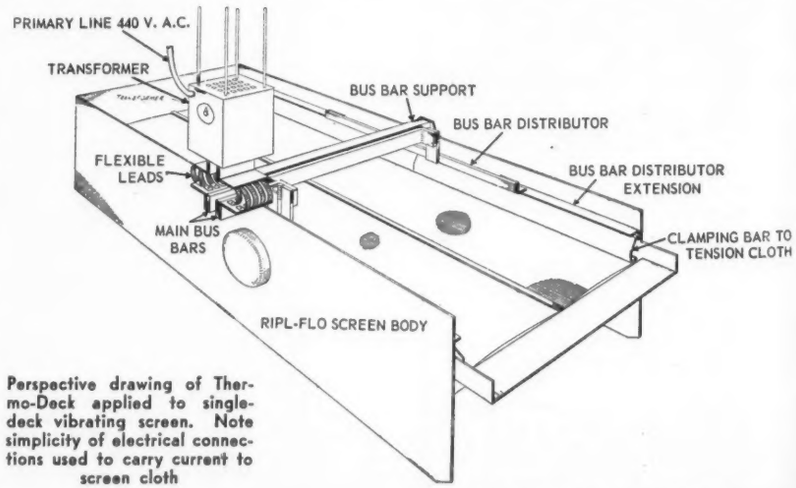
Low-voltage current is applied to medium or medium-fine cloth, through simple connections, to eliminate blinding by moist, fine materials

USES: Prevents blinding of screens when handling coal, agricultural limestone, or any fine, moist material that molds when squeezed in the palm of the hand. Such materials tend to adhere to screen wires and gradually build up until the openings are partially or completely closed. Can be installed on single-deck vibrating screens, or on the top, middle, or bottom deck or multiple-deck screens.

Unit is intended for screens with fine or medium-fine cloth, not for the coarser cloth. It should not be used when screening readily flammable or explosive materials.

Features: Besides increasing screening capacity, this method of preventing blinding lengthens screen life because screen does not have to be kept clean by pounding, brushing, or flame heating with a torch. Some operators have reported a threefold increase in screen life since installing the heating unit. Incidentally, part of this increased life span is caused by elimination of the extra whipping that blinded screen cloth will do. Heating unit is simple and is harmless to workers because it is low-voltage. Transformers used are 5 to 30 kva, 220 or 440v primary, 2 to 10v secondary, depending on screen area, specs of screen cloth, and whether it is carbon or stainless steel (last metal uses 50% less current). Screen surfaces can be replaced without disturbing electrical connections. According to manufacturer, moisture in the material being screened is hardly reduced, since retention time on the screen is short.

Description: Drawing reveals how the Thermo-Deck is applied to single-deck vibrating screen. It uses the standard steel clamping bars on manufacturer's screens as electrical conductors. Current is carried by pressure contact from bus bars, through the clamping bars, and to the screen cloth. Uniform distribution of heat is obtained over the entire screen surface, according to the manufacturer. Theory is that the heated wires decrease surface tension of moisture in contact with them, releasing the adhering particles. The screen vibration aids in breaking the



Perspective drawing of Thermo-Deck applied to single-deck vibrating screen. Note simplicity of electrical connections used to carry current to screen cloth

particles loose. Of course, a small amount of the particle's surface moisture is evaporated, but it is negligible.

A screen at 160 to 180°F will eliminate blinding even with a 6% moisture coal. Best operating temperature depends on feed rate, screen analysis of feed, surface moisture of feed, feed temp, and ambient temp.

Transformers furnished with the Thermo-Deck are small, air-cooled, dry type, specially designed for dusty atmospheres; no special dust-proof enclosures are required. They can be located on stationary supports adjacent to the screen, or can be suspended above the screen. Flexible copper leads are used btween the transformers and bus bars attached to screen frame. Transformers are equipped with handy tap-changing switch having four to six steps to obtain desired change in voltage. Heating can be increased or decreased at will.

(Developed by Allis-Chalmers Manufacturing Company, Dept. CP, Box 512, Milwaukee 1, Wis. . . . or for more information check CP 2449 on handy form, pages 2 & 3.)

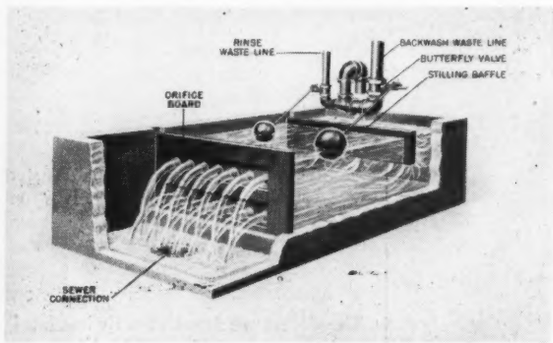
Prevents backflow of water from sump in washing, rinsing operations . . .

conforms with state as well as local laws governing back-siphoning of waste waters

Uses: Prevents excessive rate of flow during backwashing or rinsing, and eliminates back-siphoning of water. Now standard on all of maker's sodium zeolite softeners that are 54" in diameter or larger. Can be provided for hydrogen zeolite, anion exchange, and pressure type filter equipment whenever local requirements call for it.

Features: Conforms with state and local laws against back-siphoning.

Description: Anti-Back-Siphonage Wash and Rinse Controller, as it is called, allows water to flow at a constant

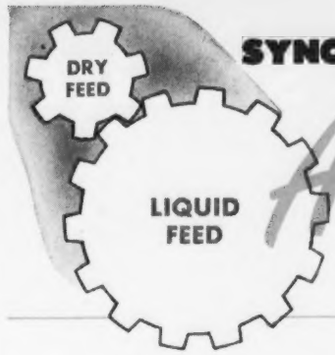


Prevents backflow of water from the sump in the water supply system during ion exchanger or filter backwashing or rinsing operations

rate through orifices of fixed size, under constant head maintained by a float-operated butterfly valve. Thus, greater than normal pressure does not affect the rate of flow.

The waste water discharge line terminates at a minimum distance of 6" above the rim of the sump. This provides a positive air gap in accordance with the requirements of the American Standards Association. It prevents backflow of water from the sump in the event that negative pressure should occur in the water supply system during the backwashing or rinsing operation. A stilling baffle prevents turbulance in the constant level water chamber, thus avoiding irregular action in the float.

(Product of The Permutit Company, Dept. CP, 330 West 42nd Street, New York, N. Y. . . . or for more information check CP 2450 on handy form, pages 2 and 3.)



SYNCHRONIZED

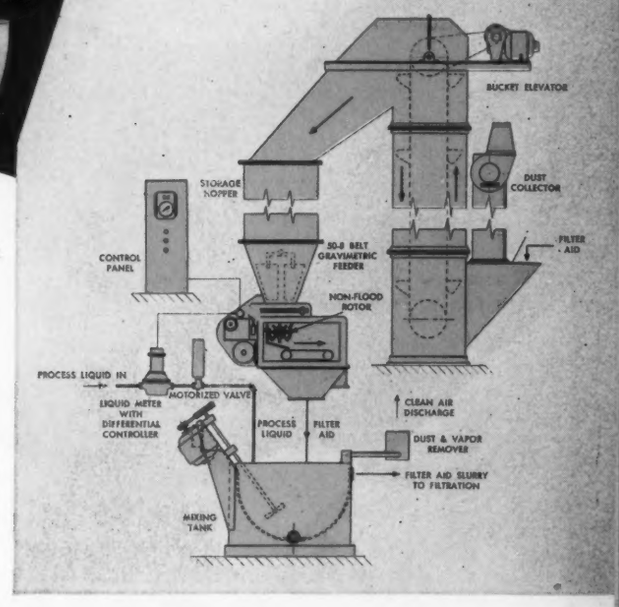
Automatic System

FOR **CONTINUOUS** PREPARATION OF FILTER AID SLURRY

Filtration — an increasingly important operation in the food, petroleum, pharmaceutical, and chemical industries — is put on a mechanized basis with this "packaged" system for preparing filter aid slurry . . . one of the many Omega Feeding and Proportioning Systems available to industry today.

This system feeds finely pulverized filter aid (weighing 7 to 15 lbs. per cu. ft.) in step with the flow of process liquid to the filters. A sensitive synchronizing unit maintains the pre-selected ratio of dry material to liquid . . . keeps slurry concentration at the optimum level . . . eliminates hit-or-miss, high-cost manual preparation. It's an Omega System throughout — from the Model 50-8 Belt Gravimetric Feeder (accurate within ± 1% by weight) to the mixing tank, dust and vapor removal devices, synchronizing mechanism, and control panel. The design and construction of this "packaged" system is 100% an Omega responsibility which relieves the customer of the purchasing and engineering of individual components.

Omega Dry and Liquid Feeders fit into the widest range of continuous processing and blending operations. Tell us about your problems and we will gladly submit recommendations and quotations. Omega Machine Company (Division of Builders Iron Foundry), 387 Harris Ave., Providence 1, Rhode Island.



Continuous slurry preparation system including Omega 50-8 Belt Gravimetric Feeder with positive, non-flood feeding mechanism; mixing tank and agitators; dust collector, bucket elevator, storage hopper; control panel and differential controller.

B·I·F INDUSTRIES

OMEGA

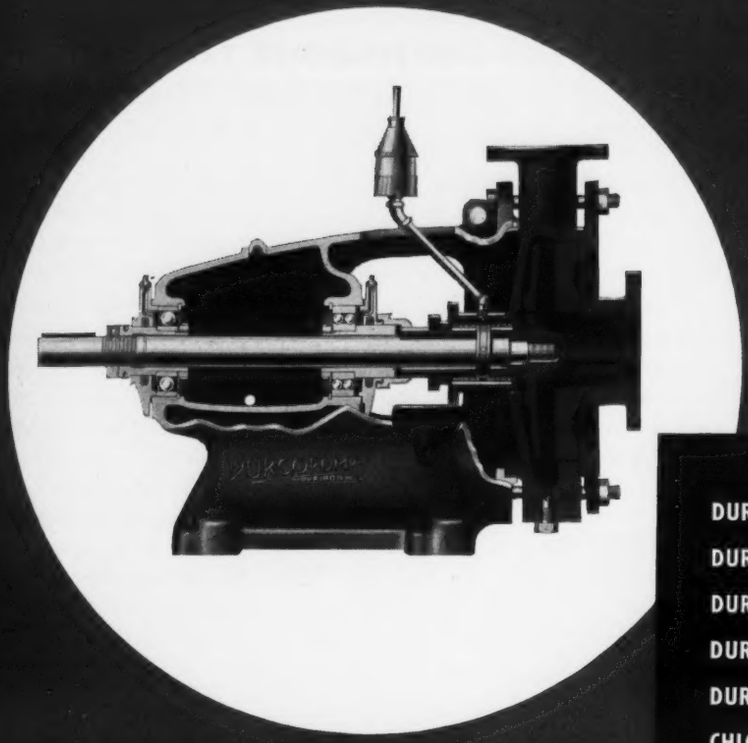
THE LAST WORD IN FEEDERS

OMEGA

Omega manufactures a complete line of volumetric and gravimetric feeders for dry materials and for gravity feeding of liquids and solutions.

When inquiring check CP 2451 on handy form, pgs. 2-3

For *tough* Chemical Service



STANDARD DURCOPUMPS IN THESE ALLOYS

DURIRON	CHLORIMET 3
DURICHLOR	DURCO D-10M
DURIMET 20	MONEL METAL
DURCO 18-8-S	INCONEL
DURCO 18-8-S-Mo	NICKEL
CHLORIMET 2	NI-RESIST #2

Series R Durcopumps, designed and built to handle severe corrosives, are available in the alloys listed above as regular production items. For the details of construction and performance of industry's standard acid pumps, write for free Bulletins P/1 and 100B.

DURCO
CORROSION RESISTING ALLOYS & EQUIPMENT

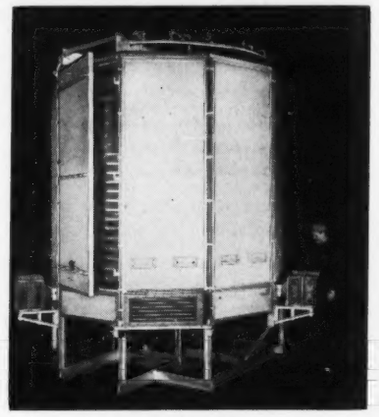
A product of **THE DURIRON COMPANY, INC., DAYTON, OHIO**

Higher evaporative capacity from continuous transfer dryer now out . . .

will evaporate 750 pounds water every hour at 300°F.

Uses: Drying feeds ranging from thick slurries to fine powders. Will handle both fragile or heat-sensitive material.

Features: Larger packaged units have been added to line, have two to four times the evaporative capacity of earlier models. Capacities of dryers in the new series range from 50 pounds of water per hour at 100°F to 750 pounds per hour at 300°F.



Larger packaged continuous transfer dryer

Trays of the new large dryers are made from one piece of sheet metal for easier cleaning.

Description: Series N Turbo-Dryers are extensions to this manufacturer's line of continuous transfer type dryers that contain shelves on which material to be dried is continuously being piled and spread while it is being subjected to a flow of heated air.

The dryers are supplied fully insulated, and have variable-speed drives for rotating the tray structure and for driving the fans.

Housing diameter is 9'6"; height varies from 7'10" to 11'9", depending on number of shelves. Total horsepower ranges from 1-1/3 to 2 hp. Units may be elevated on a steel support or set directly on the floor.

(Manufacturer is the Wyssmont Company, Dept. CP, 3104G Northern Blvd., Long Island City 1, N. Y. . . . or for more information check CP 2452 on handy form, pages 2 and 3.)

For more information on product at left, specify CP 2453 . . . see information request blank between pages 2-3.

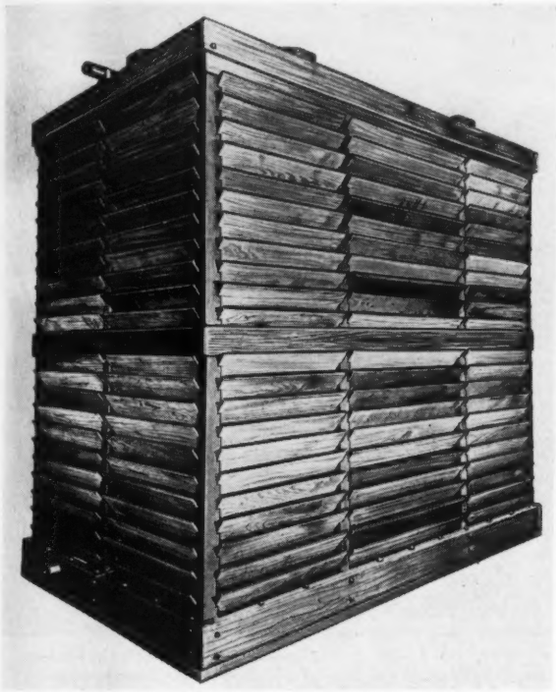
Simple, quick erection feature of cooling towers . . .

clearly marked parts can be put together on the site with hammer and wrench

Uses: Designed specifically for all water cooling problems encountered in refrigeration, air conditioning, engine jacket water cooling, steam condensers, quench oil cooling, and other heat exchange applications.

Features: Simplicity of design and precision construction assure easy, on-the-site assembly with use of hammer and wrench. Towers are shipped with all parts carefully bundled, crated, and marked for easy identification, and include galvanized steel hardware, non-clogging bronze spray nozzles, and detailed assembly instructions.

Description: Cotospray SR8, SR10, and SR12 cooling towers are atmospheric type and come in capacities ranging from 3 to 221 tons of refrigeration. Wood is clear or select



Cooling tower is quickly, easily assembled on the site

all-heart, sap-free redwood; basin floor is available either in steel sheet or T & G redwood. Thermal performance of each of the eighteen models is guaranteed for life of the tower.

Corner and louver posts are precision drilled for through-bolting to basin sills and are accurately slotted to receive louver boards. All sides are heavily braced by diagonals and mid-tower pieces for structural rigidity. Pipe for header and distribution arms is threaded.

(Manufactured by Equipment Division, J. F. Pritchard & Co., Dept. CP, 908 Grand Ave., Kansas City, Mo. . . . or for more information check CP 2454 on handy form, pages 2 and 3.)

See PROCESSING AND ENGINEERING DATA sheets for insertion in loose-leaf binders pages 182, 184, 186, & 188.

you save money (less waste)
you save time (almost automatic)
and you get

UNIFORM GRANULATION

with . . . . .

AIR SET ROLLER MILL

★ You save money when you produce granulated products with *AirSet* Roller Mills because there's less waste. And new automatic design features save operators' time. You have instant and complete control of *AirSet* Roller Mills — one or a battery. Best of all, you get *uniform granulation with minimum fines*. Better feed distribution and uniform pressure at ends of rolls provide ideal grinding for preparation of most chemicals. Push-button control, automatic roll set and roll release and other design improvements give you new grinding efficiency and the closest approach to automatic milling yet devised! They save you money and time. Contact your nearby A-C sales office for complete information or write to Allis-Chalmers, Milwaukee 1, Wisconsin.

A-3613

Motor and Texrope Drive available with *AirSet* Mill as a complete engineered unit.

AirSet and *Texrope* are Allis-Chalmers trademarks.

ALLIS-CHALMERS

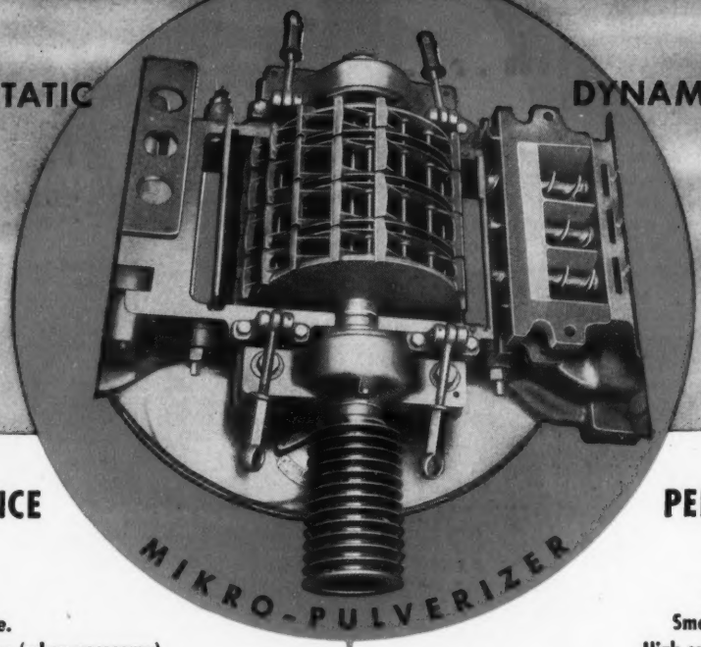
A-C ALLIS-CHALMERS

Chemical Milling and Processing Equipment

When inquiring check CP 2455 on handy form, pgs. 2-3

PERFECT BALANCE

STATIC DYNAMIC



Typical inside view of a MIKRO PULVERIZER

What PERFECT BALANCE Does:

- Eliminates vibration.
- Lengthens life of machine.
- Permits ceiling suspension (when necessary).

What PERFECT BALANCE Gives:

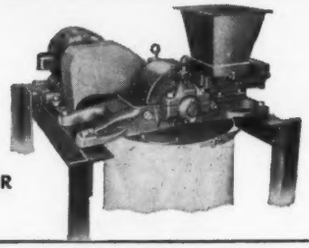
- Flexibility in installation
- Smoother machine operation
- High constant rate of production

Long Life Span

Many of our first MIKRO-PULVERIZERS, built more than a quarter century ago, are still in active service. Perfect balancing of all moving parts has had much to do with this longevity.

Catalog Tells All

If you are presently confronted with a problem concerned with pulverizing or granulation of materials, write today for a copy of the MIKRO illustrated catalog.



No. 2DH MIKRO PULVERIZER

The MIKRO PLAN for Processing Efficiency

This plan has enabled both large and small manufacturers of diverse products to improve quality of product, increase volume and cut both maintenance and production costs. It can also be helpful to you if you have a problem in pulverizing or granulating materials. Just let us know what your problem is and the three-way MIKRO-PLAN will start to work for you. Our engineers will advise the best method and equipment to solve your problem.

1682

PULVERIZING MACHINERY COMPANY
60 Chatham Road **Summit, N. J.**

PRESERVE OUR HERITAGE: FAITH, FREEDOM AND INCENTIVE

MIKRO-PULVERIZER (FINE) -ATOMIZER (ULTRA FINE)
Reg. U. S. Pat. Off.
Also Makers of the MIKRO-COLLECTOR

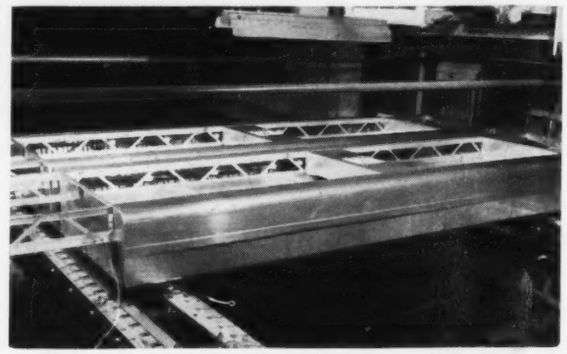
When inquiring check CP 2456 on handy form, pgs. 2-3

Sets nylon at less than $1 per yard . . .

radiant heat treats 16 yards or more per hour as synthetic fabric passes on tenter frame

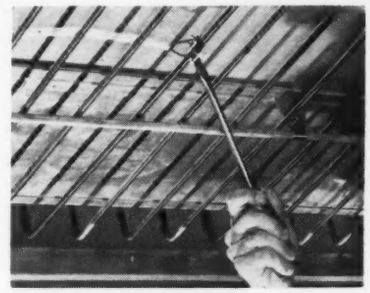
Uses: Continuous setting of nylon and other synthetic tricots and woven fabrics by radiant heat. Designed to be installed on existing tenter frames, but is also a part of manufacturer's continuous unit that includes automatic feed, tenter frame, dryer, setter, and take-off. Operating temperatures may be as high as 1500 degrees.

Features: Average machine speed is 16 yards per minute,



Electro-setting unit in working position above a tenter frame

but higher speeds can be accomplished by adding more heat reflector units. Operating costs are reported to be 50c to $1 per hour. This method of setting — by radiant heat — requires five instead of ten steps as required by autoclave and other older methods. Material can be set after dyeing and while still on the tenter frame, which means that dimensions can be accurately maintained. Dyed goods come out with uniform color, no streaks.



Close-up of Calrod units in heater at the point where thermocouple is attached

Heat is uniform across tenter frame so that there is no "edge waste." Reflector frames raise automatically if flow of fabric through tenter frame stops.

Description: Unit is complete package consisting of framing, cabinet, automatic elevating device, exhaust blowers, radiant heat units, and all control mechanisms. The aluminum reflector units house G-E Calrod tubular heaters. Automatic temperature control is provided by a G-E Reactrol, an electronic temperature control unit which allows automatic stepless heat adjutment through thermocouples located in the reflector frames.

(Manufactured by McCreary Machine Works, Inc., Dept. CP, Cohoes, N. Y. . . . or for more information check CP 2457 on handy form, pages 2 and 3.)

Covers industrial insulators

Eight-page booklet describes insulators for chemical and electrical industries. Four grades of insulators are offered in technical data table, which lists their electrical, mechanical, and physical properties. Variety of insulators

for electrical appliances are shown, as well as pilot tips for water heaters and gas outlets for natural and manufactured gases. Two-color booklet states that insulating material is non-corrosive, non-carbonizing, and heat resistant.

Suggested uses of insulators include control and X-ray equipment, industrial heating devices, gas and chemical apparatus, etc. "Lava for Industry" is issued by M. Kirchberger & Co., Inc., Dept. CP, 1425 37th St., Brooklyn, N. Y. When inquiring specify CP 2458 on handy form, pages 2 and 3.

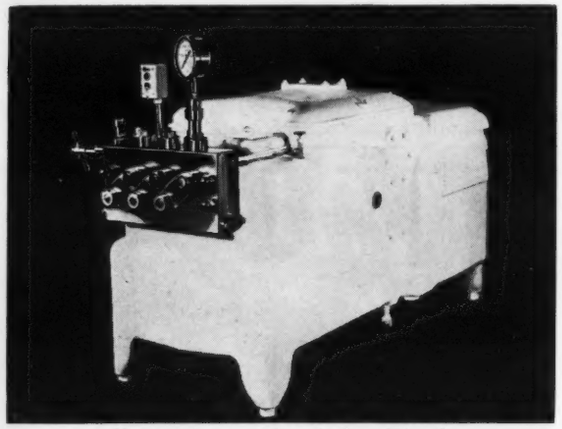
Homogenizer increases capacity to 800 gal per hr with larger plunger . . .

diameter of plunger was altered instead of increasing speed at the end of drive

Uses: Thorough mixing of pharmaceuticals, pigments, mineral oils, and oil additives.

Features: Capacity increased to 800 gph by using larger diameter plunger rather than increasing the speed at the drive end.

Description: Models are available with single or two-stage valves to operate at maximum pressures of 2500 psi. All product surfaces are stainless steel. Cylinder block is



Homogenizer capacity raised to 800 gph

18-8 stainless and designed to eliminate stuffing boxes, packing glands, gland bolts, etc. Plunger seals are located in cylinder bore to permit easy adjustment and removal. Slow speed at drive end and large helical gears extend bearing life.

(Product of Cherry-Burrell Corporation, Dept. CP, 427 W. Randolph St., Chicago 6, Ill. . . . or for more information check CP 2459 on handy form, pages 2 and 3.)

Reports role of dust collectors in roofing manufacture

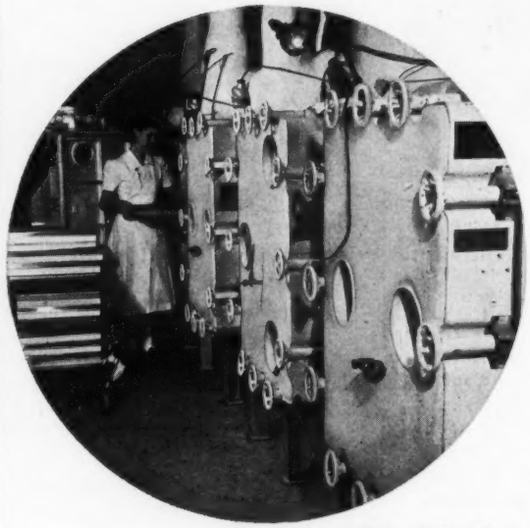
Case histories and flow diagrams of the application of cloth-type dust collectors in the manufacture of roofing materials are illustrated in industrial report bulletin. Special attention is given to ventilation of mica and scrap recovery through use of carefully engineered hood and duct work which prevents the loss of valuable material in the form of dust.

Bul 322 is issued by the American Wheelabrator & Equipment Corp., Dept. CP, Mishawaka, Ind. When inquiring specify CP 2460 on handy form, pages 2 and 3.

Modern Benefits

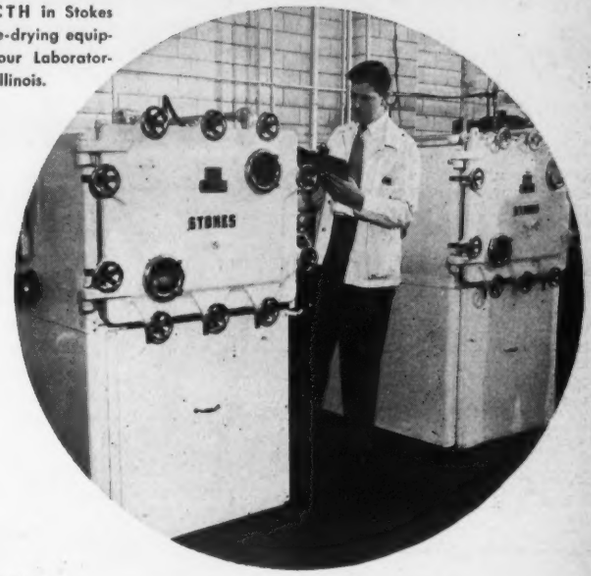
to the hog.....from the hog

by Vacuum Processing



Vacuum freeze-drying of hog cholera serum at Pitman-Moore Laboratories, Zionsville, Indiana.

Processing ACTH in Stokes Vacuum freeze-drying equipment at Armour Laboratories, Chicago, Illinois.



New serums made by vacuum freeze-drying give promise of wiping out the plague of hog cholera which for a century or more has cost the world incalculable millions of dollars.

New hormones made by vacuum freeze-drying from hog glands are effecting dramatic alleviation or cure of arthritis and many other diseases.

Vacuum freeze-drying — one of many modern techniques pioneered by Stokes and carried out commercially with Stokes equipment — captures life, defies oxidation, halts aging, preserves potency, for the benefit of mankind.

Stokes engineers invite consultation on modern vacuum techniques of chemical processing — drying, impregnating, metallizing — of pharmaceuticals, chemicals and many industrial products.

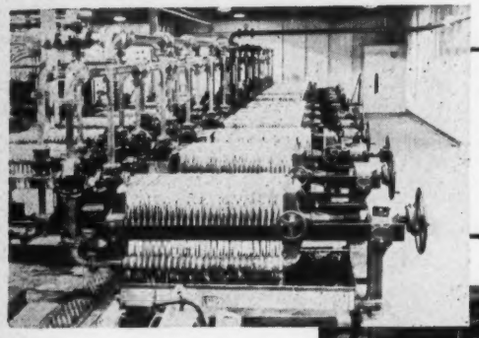
STOKES

STOKES MAKES
Plastics Molding Presses,
Industrial Tabletting
and Powder Metal Presses,
Pharmaceutical Equipment,
Vacuum Processing Equipment,
High Vacuum Pumps and Gages,
Special Machinery

F. J. STOKES MACHINE COMPANY, 5574 TABOR ROAD, PHILADELPHIA 20, PA.

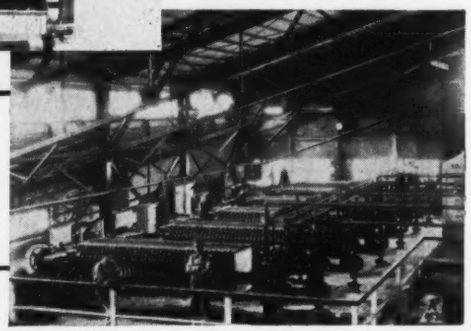
When inquiring check CP 2461 on handy form, pgs. 2-3

for Rayon or Gold.... Sugar or Penicillin..



Shriver filter presses in one of the plants of the world's largest rayon producer; more than 1800 such Shriver units are being used by the rayon industry for filtering cellulose xanthate and cellulose acetate.

Leading metal refiners such as this large Western plant, use Shriver filter presses for recovering gold, silver, copper, zinc, nickel precipitates, and clarifying electrolytes.



or a thousand other products

SHRIVER FILTER PRESSES

give better filtration at lower cost

Whether it's rayon or furfural, silver or zinc, brewery mash or wine, colors, salts, glue, clays, oils or pharmaceuticals . . . or a host of other products that need improvement through filtration—you can bet a Shriver Filter Press will do more jobs for you, better, at lower over-all cost.

Straight Facts Prove Shriver Filter Presses

- Are lowest in cost per sq. ft. of filtering area
- Filter any material, even thick or viscous
- Recover solids, reasonably dry, firm, easy to handle
- Wash, extract, thicken, steam out, melt, redissolve
- Operate at any pressure or temperature
- Clarify, bleach, decolorize, deodorize, germproof
- May be made of any metal, wood, rubber, plastic

Can you ask for more? Get ALL the facts.
Get them straight. Get the new Shriver Catalog.

T. SHRIVER & COMPANY, Inc.
846 HAMILTON STREET · HARRISON, N. J.

When inquiring check CP 2462 on handy form, pgs. 2-3

PROCESSING EQUIPMENT

Condensing vapors will contact only Type 316 . . .

vapors are in tubes of one model, outside in other

A new line of stainless steel vapor condensers has recently been announced. All parts contacting the gaseous or condensed vapors are Type 316 stainless steel; all other parts are carbon steel. Condensers are offered in two basic designs: Model VT where vapors are in the tubes and coolant in shell, and Model VS where vapor is in the shell and coolant in the tubes.

Model VT is made in ten sizes ranging from 52 to 350 sq ft of effective surface. Model VS is supplied in eight sizes ranging from 62 to 317 sq ft of effective surface. Shell side design pressure for each model is 75 psi, test pressure 150 psi. Tube side design pressure for each is 75 psi; Model VT tube side test pressure is 100 psi, while the same pressure for Model VS is 150 psi.

(Made by Doyle & Roth Manufacturing Company, Dept. CP, Foot of 23rd St., Brooklyn 32, N. Y. . . . or for more information check CP 2463 on handy form, pages 2 and 3.)

Seals, primes aluminum in single operation . . .

has exceptionally high resistance to moisture

Uses: Zinc chromate type primer and sealer for aluminum metals. Suitable as a 1-coat system in interior applications, or as a base for nitrocellulose lacquer or synthetic enamel top coats.

Features: Resistance to moisture is definitely the most outstanding characteristic of this coating. By sealing and priming in the same operation, aluminum finishing operations can be speeded.

Description: Northrop Seal Primer No. 75 may be applied by spray after reduction with toluene (2 gal thinner to 1 gal primer). Maximum dry film thickness should be ½ mil maximum.

It dries to touch in 5 minutes under normal conditions. It can be top-coated in 10 minutes.

Excellent hold-out to top coats is reported, yet adhesion of these top coats is high.

In laboratory tests, some panels were coated with No. 75, and others with a conventional zinc chromate primer for comparison. No. 75 is reported to have excelled in the following; salt

. . . these **Waukesha P. D.* Sanitary Pumps**

Will Earn Money for YOU . . . In Savings and Product Protection

WAUKESHA P.D.* SANITARY PUMPS

Available in capacities from 20 lbs. to 60,000 lbs. per hour — against head pressures up to 100 lbs.

WAUKESHA SHIFTSPEED SANITARY PUMP

Permits capacity changes while pump is in operation. Just turn the handwheel, watch the dial on top of housing.

Whether your product is light liquid, creamy, semi-solid or even chunky, you can handle it more efficiently and more economically with a WAUKESHA P. D. Pump. For with Waukesha's Positive Displacement principle of action, your product comes *out* of the pump exactly as it goes into the pump. There's no possibility of churning, aeration, agitation, crushing. That's why it's standard in leading food, beverage, dairy, chemical and textile plants the country over.

Write or wire — for advice and details on the Waukesha P.D. Sanitary Pump to fit your needs exactly.
*P.D. — Positive Displacement — Smooth Flow — Slow Speed

WAUKESHA FOUNDRY COMPANY
Waukesha, Wisconsin

Waukesha 100% SANITARY PUMPS
Dependable Product of a Responsible Manufacturer

When inquiring check CP 2464 on handy form, pgs. 2-3

Sludge BURNS CLEAN

WITH **NATIONAL AIROIL TYPE "S-A-D" BURNERS**

. . . waste material is pumped directly to the burner and mixed with fuel oil in the burner body; insures ease and stability of ignition; eliminates stack solids; uses steam or compressed air for atomization; functions entirely on fuel oil where supply of waste material is intermittent; and assures continuous operation without cleaning or clogging. Bulletin 21 gives complete details.

NATIONAL AIROIL BURNER COMPANY, INC.
1300 East Sedgley Ave., Philadelphia 34, Pa.
Southwestern Division: 2512 So. Blvd., Houston 6, Tex.

When inquiring check CP 2465 on handy form, pgs. 2-3

spray resistance, weather resistance, lacquer resistance, water resistance, flexibility, gasoline immersion, and separation tests.

(Product of The Sherwin-Williams Company, Dept. CP, 101 Prospect Ave., NW, Cleveland 1, Ohio . . . or for more information check CP 2468 on handy form, pages 2 and 3.)

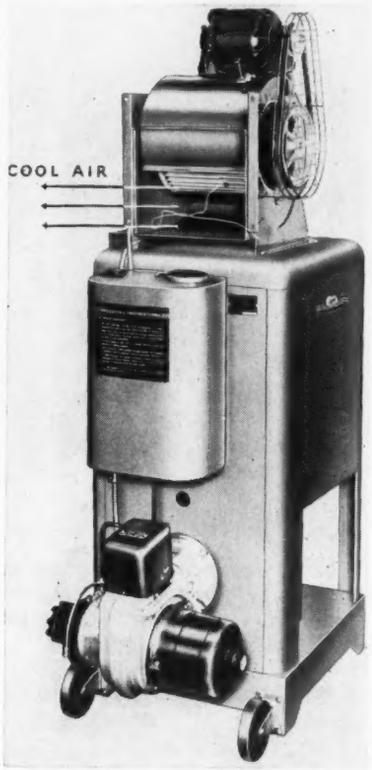
Dual-purpose machine furnishes heat or cool air . . .

portable furnace concentrates air at worker level

Uses: For providing heat in winter or cool air in summer.

Features: By concentrating heat output (189,000 Btu/hr) in work zone from floor to about 6′ in height, unit heats men at work, not empty spaces, manufacturer reports.

Description: Model PW-189 delivers heat at floor level over an area

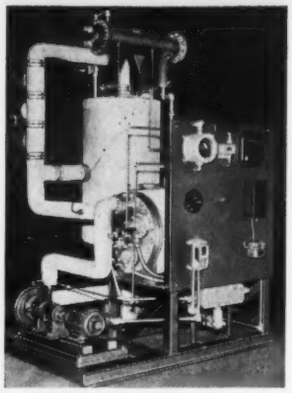


approximately 3000 sq ft. Model is also designed for easy conversion to a cool air blower in summer. By changing top blower mounting, within 5 min the machine delivers 1500 cfm of cool air.

(Development of the Fageol Heat Machine Co., Dept. CP, Detroit 11, Mich. . . . or for more information check CP 2469 on handy form, pages 2 and 3.)

Struthers Wells

ELECTRICALLY HEATED UNIT for High Temperature Processes



Supplied complete ready for immediate use in heating and cooling service, this unit is available in capacities from 100,000 to 500,000 BTU per hr. Using Dowtherm it has a temperature range to about 750° F. It also is adaptable to other types of heat transfer fluids for lower temperature operation. Due to the correct design of the heating elements, no thermal breakdown or coking troubles are encountered. *Write for Bulletin B-45 on your letterhead.*

Struthers Wells
CORPORATION
Warren, Pa.

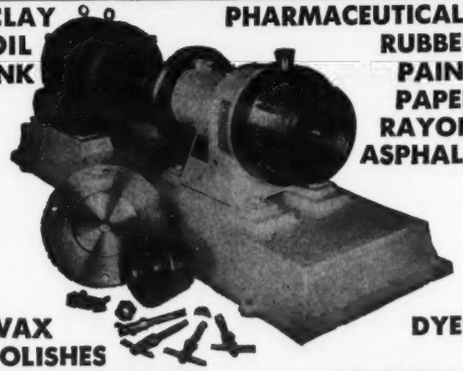
Struthers Wells

PLANTS AT WARREN, PA. • TITUSVILLE, PA.

When inquiring check CP 2466 on handy form, pgs. 2-3

CHARLOTTE
COLLOID MILLS
Control Product · Improve Production

• CLAY
• OIL
• INK
• PHARMACEUTICALS
• RUBBER
• PAINT
• PAPER
• RAYON
• ASPHALT
• WAX
• POLISHES
• FOOD PRODUCTS
• DYES
• COSMETICS



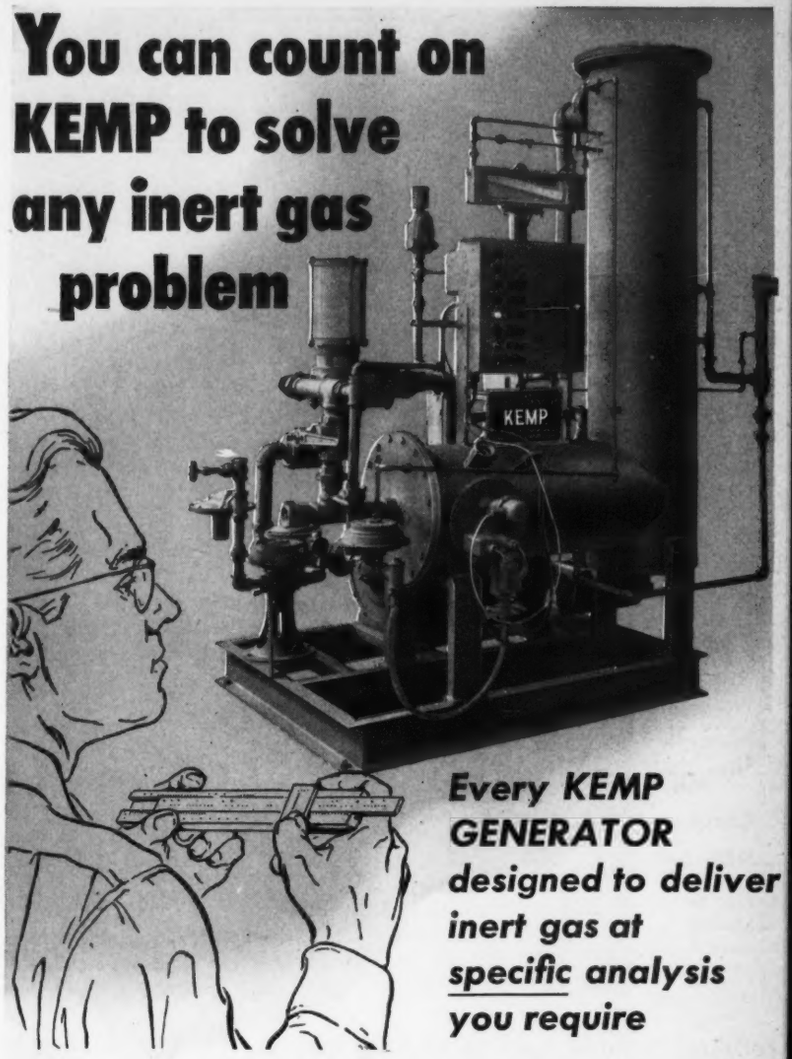
Write for Descriptive Literature

THE CHARLOTTE PRINCIPLE GROOVED ROTOR & STATOR

CHEMICOLLOID LABS INC.
Manufacturer and Distributor
30 CHURCH ST., NEW YORK 7, N. Y.
DISTRICT OFFICES
Baltimore • Chicago • Detroit • Los Angeles • Atlanta • New Orleans

When inquiring check CP 2467 on handy form, pgs. 2-3

You can count on KEMP to solve any inert gas problem



Every KEMP GENERATOR designed to deliver inert gas at specific analysis you require

DAY AFTER DAY Kemp users throughout the chemical field report: Kemp Inert Gas Generators *maintain a specific analysis* of chemically clean inert gas *regardless* of demand . . . eliminate the possibility of mixture fluctuations in critical processing . . . offer the finest choice of flexibility in design. Fast-starting, easy-to-operate Kemp Generators also *save* you both *time* and *money* by reducing costly warm-up period necessary for starting other makes. You can't go wrong when you specify Kemp.

Set it . . . forget it!

The Kemp Industrial Carburetor, standard equipment and the very heart of every Kemp installation, assures you complete combustion . . . without tinkering . . . without waste. Uses ordinary gas right from mains. Every Kemp Design includes complete up-to-the-minute fire checks and safety devices. Why not find out how Kemp can help you with your problems?

KEMP OF BALTIMORE

INERT GAS GENERATORS
Write for Bulletin I-10 for technical information
THE C. M. KEMP MFG. CO.
405 E. Oliver Street, Baltimore 2, Md.

When inquiring check CP 2470 on handy form, pgs. 2-3

A regular "busybody" around your chemical plant

Sticks Its Nose into Any Material-Handling and Excavating Work . . . And Gets the Job Done Fast

Allis-Chalmers HD-5G

1 cu. yd. Bucket, 40 drawbar hp. Dumping Height — 9 ft., ¼ in.

Interchangeable attachments include: Special buckets — up to 2-yd . . . Bull-dozers for excavating and backfilling . . . Crane Hook for heavy lifting . . . Lift Fork for handling palletized loads . . . Trench Hoe for footings, pipe — other trenching.

Fertilizer — Works right up on a big Stockpile

to eliminate overhang . . . and scoops out a full cubic yard at a pass with standard bucket. Only a crawler tractor gives you the traction you need to handle this tough digging . . . and only this A-C crawler gives you 2-speed reverse and 1,000-hour lubrication of truck wheels to protect your working time, increase output.

Coal — Stores, Compacts and Reclaims

This flexible unit can build stockpiles in any available space. Ability to spread and pack coal in thin, horizontal layers eliminates flues — the main cause of spontaneous combustion. Standard track shoe eliminates coal breakage. As coal is needed, the HD-5G quickly loads from stockpile to trucks. On short hauls, it dozes or carries coal directly to plant.

Waste — Cleans Up and Loads

Out in the yard, this busy tractor cleans up and loads industrial waste, excavates, trenches and backfills on new construction, spots cars, clears snow . . . handles many other jobs winter and summer.

Send coupon for free literature describing this one-tractor fleet.

ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

ALLIS-CHALMERS TRACTOR DIVISION
1125 South 70th St., Milwaukee 1, Wis.

Please send me literature on the Tracto-Shovel line:
☐1-yd. HD-5G ☐2-yd. HD-9G ☐3-yd. HD-15G ☐4-yd. HD-20G

Name .....

Title .....

Company .....

Address .....

When inquiring check CP 2471 on handy form, pgs. 2-3

Material

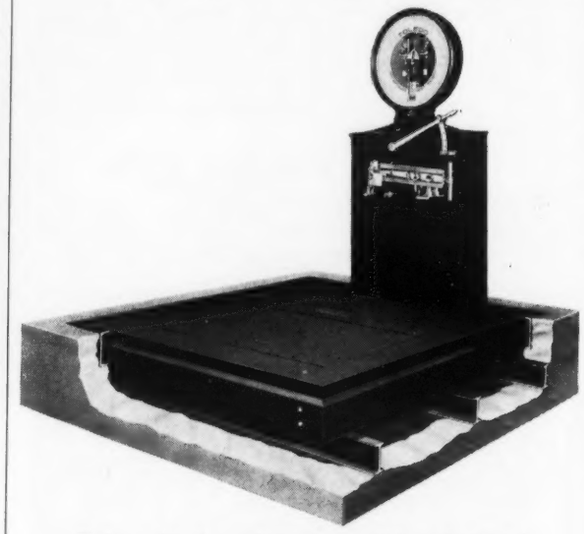
Recessed frame design of scale prevents foreign mat'l from clogging mechanism . . .

no shelf where powder or granules can pile up between frame and platform

Uses: For weighing operations and especially those involving powdered or granulated materials.

Features: Prevents weighing errors that result when foreign material or dirt lodges beneath the scale platform and interferes with its free movement.

Description: As can be seen in accompanying photo, the platform flange overhangs the frame which is angled inward. Any material seeping off the scale platform is deflected by the flange. There is no shelf where the material can pile up between the frame and the platform,



Platform of scale overhangs frame which angles inward

and then gradually work its way inside the frame which houses the scale levers.

All foreign material is kept outside the frame which is especially important where materials are of a corrosive nature. The latter, of course, could seriously affect pivots and bearings.

Inclined frame construction is available on Toledo Model 1500 and 1900 Floor Scales.

(Available from Toledo Scale Co., Dept. CP, Toledo 1, Ohio . . . or for more information check CP 2472 on handy form, pages 2 and 3.)

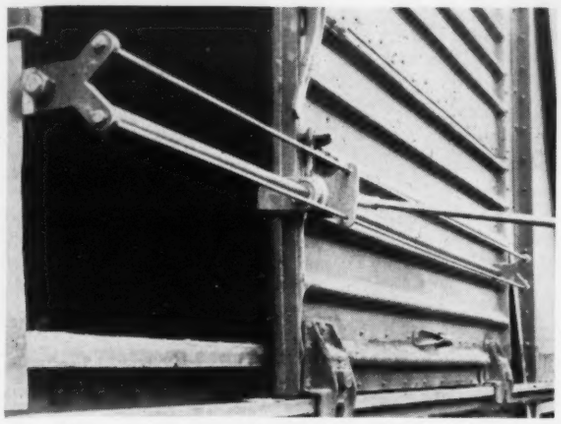
One man can exert 4000-lb pressure, open freight car doors easily . . .

mechanical steel device weighs only 34 lb, does not jerk doors off runners

Uses: For opening "balky" freight car doors.

Features: Simplicity, speed, safety are incorporated in 34-lb mechanism which enables one man to exert a force of 4000 lb against freight car door without forcing it off the runner.

Description: Penco E-Z Way freight car door opener is made of high-strength alloy steel with a built-in "lift



Allows one man to apply 4000-lb thrust against doors

and holding cam." Opens and closes any car door smoothly and easily without pushing or pulling, and can be used at any height of the car door opening, off the ground or off the dock. The "lift and holding cam" does the job without chains. Two small chains are provided to suspend the device for one-man operation. Meets all Safety Appliance laws and ICC safety rules, according to the manufacturer.

(Product of the Penco Engineering Co., Dept. CP, 25 California St., San Francisco 11, Calif. . . . or for more information check CP 2473 on handy form, pages 2 & 3.)

Lightweight conveyor is collapsible for quick transfering where needed . . .

can be placed on stairs to carry loads between floors and eliminate permanent installations

Aluminum heavy-duty portable conveyor is designed for use around the plant or warehouse for stacking or for horizontal moving. Because of its light weight, (two men can carry it) conveyor can speed loading or unloading of

Portable aluminum conveyor is designed for heavy duty

trucks and cars at the dock. Special design makes it possible to actually lay conveyor on stairs for transferring material between floors, eliminating the need for permanent installation. Conveyor folds down for carrying on trucks.

(Product of the Seedburo Equipment Co., Dept. CP, Converse Bldg., Chicago 6, Ill. . . . or for more information check CP 2474 on handy form, pages 2 and 3.)

Stacking cases four tiers high at Alaska Packers, Alameda, California

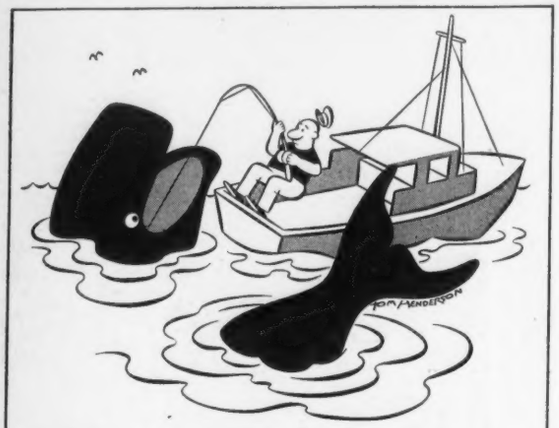
Stack Twice As High . . . store twice as much, do it in half the time with Towmotor fork lift trucks. Towmotor handles *all* types of material. For the name of your nearest Towmotor Representative and a TOWMOTOR SAFETY KIT—a portfolio of safety tips and colorful plant safety posters—write Towmotor Corporation, Div. 23, 1226 E. 152nd St., Cleveland 10, Ohio.

TOWMOTOR
THE ONE-MAN-GANG®

FORK LIFT TRUCKS and TRACTORS

RECEIVING • PROCESSING • STORAGE • DISTRIBUTION

When inquiring check CP 2475 on handy form, pgs. 2-3



There's a Yale hoist for *every* lifting job!

IF YOUR PROBLEM is to save manpower—increase production—speed lifting of any weight from 500 lbs. to 40 tons—get in touch with YALE. For YALE has pioneered in the development of safer, more efficient hoisting equipment of every kind. That's why your YALE Distributor can give you such valuable assistance in choosing the *right* hoist for your particular needs. He's listed in your Classified Directory, and ready to help you any time.

Illustrated is *portable* Load King Aluminum Hand Hoist. Half-ton model weighs *only 36 lbs.* Ball bearings in all rotating shafts minimize friction ...raise hoist efficiency *up to 95%*. Precision-engineered safety features include SYNCHRO-MATIC Load Brake, fracture proof steel Safety Hooks.

CAPACITIES:
½, 1, 1½ and 2 tons

YALE & TOWNE

The Yale & Towne Manufacturing Co., Phila. 15, Pa.

YALE is a registered Trade Mark of The Yale & Towne Mfg. Co.

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I'm interested in lifting for less with a YALE Hoist.

☐ Please have your local Distributor call on me.
☐ Please send detailed literature on ☐ YALE Hand Hoists. ☐ YALE Electric Hoists.

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In Canada write: The Yale & Towne Manufacturing Co., St. Catharines, Ont.

YALE GAS AND ELECTRIC INDUSTRIAL TRUCKS • YALE WORKSAVERS
YALE HAND TRUCKS • YALE PUL-LIFTS

When inquiring check CP 2476 on handy form, pgs. 2-3

Flexibility of operation is featured in 4-drum triple tiering lift truck . . .

carrier attachment shifts automatically to grip load when truck is not in line

Uses: For carrying or storing drums.

Features: Four-drum capacity carrier attachment is equipped with a mis-alignment compensator which automatically shifts the carrier up to a maximum of 4" when the lift truck is not in line with the load. Compactness of unit loads permits closer spacing, double and triple tiering.

Description: Carrier attachment is 54 x 51", weighs 750 lb, and is mounted on a 3000 lb capacity Jeep truck, Model A-3444. Front of carrier may be used to push drums into pick-up position. Specially engineered angles automatically place drums into gripping position as the drum carrier frame is lowered over the load. Gripping shoes are equipped with non-slip lining and quickly conform to the contour and position of drums. Weight of drums and the gravity-wedging action of the gripping shoes insures a positive grip. A hydraulic power unit control activates the load-releasing mechanism by applying hydraulic pressure which retracts the gripping shoes.

With a carrier attachment, lift truck handles four drums at a time

(Product of the Mercury Manufacturing Co., Dept. CP, 4044 S. Halstead St., Chicago 9, Ill. . . . or for more information check CP 2477 on handy form, pages 2 & 3.)

Fork truck operator can tilt drums easily with hydraulic up-ender . . .

panel control allows automatic operation without leaving driver's seat

Uses: For lifting, transporting, stacking and emptying heavy drums or other cylindrical objects.

Features: With clamp and tilt controls dash-mounted, operator can maintain control without leaving his seat.

Description: Hydraulic up-ender can be mounted on manufacturer's 2000, 3000, and 4000 lb fork trucks. Drums can be rotated 90° for vertical or horizontal stacking, or tilted 45° below horizontal for emptying at any height within the lift range of the truck. Attachment consists of shoes which are "pinned" to the forks of manufacturer's 4-purpose carriage. Mounted on the shoes are pivoted, rubber-faced, grab plates which clamp

Safeguard PRODUCT QUALITY with

NILES
BARRELS AND DRUMS
of ENDURO® Stainless Steel

Don't take chances with product contamination. Use barrels and drums of Enduro—the lustrous metal that is inert to most chemical and food products—that is sanitary and easy to clean—that is resistant to corrosion—that is tough and strong—that is economical to use because it lasts so long.

The NILES Line offers a type and size for every chemical and food plant need. Write us for literature.

★ ★ ★

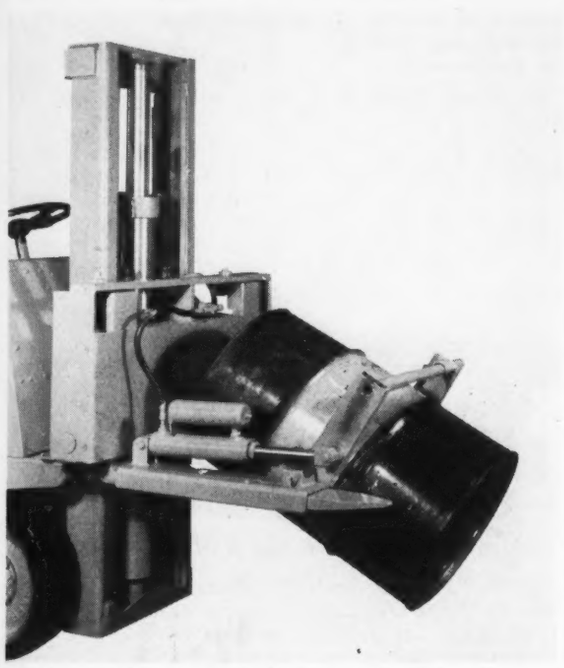
The solid head drum at the left and the patented Ringlox drum shown above are but two of the many styles in the complete NILES Line.

NILES STEEL PRODUCTS DIVISION
REPUBLIC STEEL CORPORATION
462 Walnut St. • Niles, Ohio

REPUBLIC STEEL

NILES
METAL BARRELS AND DRUMS

When inquiring check CP 2478 on handy form, pgs. 2-3



No need for operator to leave seat when tilting drums with hydraulic up-ender

around the drum and hold it firmly. Up-ending operation is accomplished through a hydraulic cylinder mounted on one of the shoes. Operation of the hydraulic cylinder builds up pressure in an actuating accumulator mounted above it, which is used to return the drum to an upright position.

Unit weighs 100-120 lb, has a rotation of 135° from vertical, and a clamping pressure up to 1000 lb. (Development of Baker Industrial Truck Division, Baker-Raulang Co., Dept. CP, 1250 W. 80th St., Cleveland, Ohio . . . or for more information check CP 2479 on handy form, pages 2 and 3.)

Pumps deliver 1 to 80 gpm at 100 to 6000 psi

Dimensions and specifications of high pressure pumps are offered in 28-page booklet. Four types of power pumps are described to meet various industrial requirements. For small pumping jobs, one model is designed to operate with delivery from two gpm at 600 psi to six gpm at 300 psi.

Another inside-packed pump is intended for general pumping needs which require capacities up to 80 gpm at pressures to 800 psi. To meet demands for extremely high pressures, an outside-packed pump is offered which operates at pressures of 6000 psi and has capacity range from 1 to 7.5 gpm.

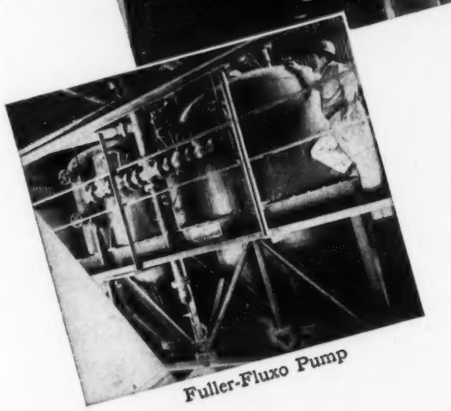
Featured item is power end which may be completed by purchaser with a solution end to meet specific needs. Units can be used to handle liquid oxygen, acids, industrial press work in metal or plastics, and other processing applications.

Schematic diagrams and cutaway illustrations are presented for each unit. Photographs show actual operation of pumps in chemical, petroleum, steel, and gas industries. "High Pressure Industrial Power Pumps" is issued by John Bean Division, Food Machinery and Chemical Corp., Dept. CP, Lansing 4, Mich. When inquiring specify CP 2480 on handy form, pages 2 and 3.

Fuller-Kinyon Pumps

The Airveyor

F-H Airslide



Fuller-Fluxo Pump

You get 25 Years of

practical experience in pneumatic conveying

You don't get it from text books—although "book-learning" helps. You get it from the school of hard knocks—experience, plus common-sense engineering . . . continually digging into a problem to find a practical answer. Twenty-five years of this kind of experience has resulted in the ability to design and build pneumatic conveying systems second to none.

This experience, accumulated during the years from hundreds of installations made in various industries, is unequalled anywhere in the field of pneumatic conveying. It is an experience that is difficult, if not impossible, to write into specifications or to show on blue prints; yet it is inherent in every piece of Fuller Equipment.

Fuller occupies a position unique in the field of pneumatic conveying. It designs and builds four primary types, from which it can select the one or combination best adapted to your specific requirements. In other words, there is no guess-work, no "good enough" equipment specified . . . only equipment *best* suited to do the work most efficiently and economically with the materials to be handled.

When you are faced with the problem of conveying dry, pulverized, and granular materials, call in a Fuller engineer for practical, experienced advice.

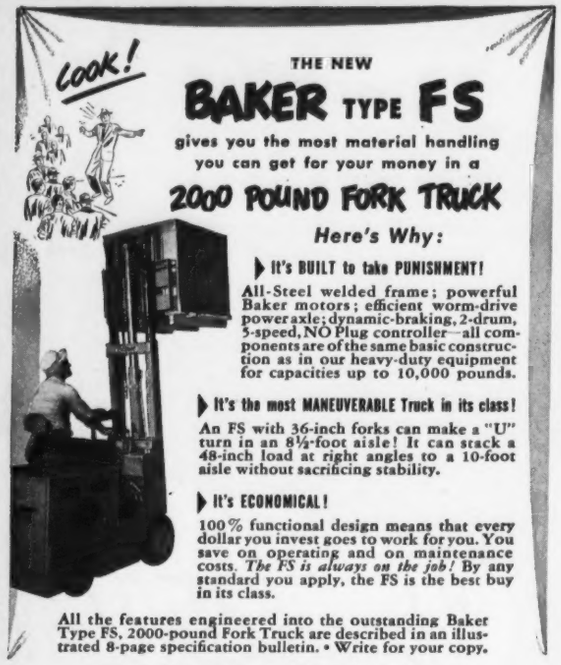
Fuller

FULLER COMPANY, Catasauqua, Pa.
Chicago 3—120 So. LaSalle St.
San Francisco 4—420 Chancery Bldg.

G-70

DRY MATERIAL CONVEYING SYSTEMS AND COOLERS—COMPRESSORS AND VACUUM PUMPS—FEEDERS AND ASSOCIATED EQUIPMENT

When inquiring check CP 2481 on handy form, pgs. 2-3


Look!
THE NEW
BAKER TYPE FS
gives you the most material handling you can get for your money in a
2000 POUND FORK TRUCK
Here's Why:
It's BUILT to take PUNISHMENT!
All-Steel welded frame; powerful Baker motors; efficient worm-drive power axle; dynamic-braking, 2-drum, 3-speed, NO Plug controller—all components are of the same basic construction as in our heavy-duty equipment for capacities up to 10,000 pounds.
It's the most MANEUVERABLE Truck in its class!
An FS with 36-inch forks can make a "U" turn in an 8½-foot aisle! It can stack a 48-inch load at right angles to a 10-foot aisle without sacrificing stability.
It's ECONOMICAL!
100% functional design means that every dollar you invest goes to work for you. You save on operating and on maintenance costs. The FS is always on the job! By any standard you apply, the FS is the best buy in its class.
All the features engineered into the outstanding Baker Type FS, 2000-pound Fork Truck are described in an illustrated 8-page specification bulletin. • Write for your copy.
THE BAKER-RAULANG CO.
1210 WEST 80th STREET, CLEVELAND 2, OHIO
Baker INDUSTRIAL TRUCKS

When inquiring check CP 2482 on handy form, pgs. 2-3

METZGAR
GRAVITY
WHEEL & ROLLER
CONVEYORS
Saves up to 70% time in loading, unloading, warehouse handling and production line flow of work at no cost for power. Portable or permanent installation. Lubricated for life. Ball Bearing throughout.
GRAVITY POWER Costs Nothing
Standard 11½"; 15"; 18" widths . . . 5'; 10' lengths. Curves 5'; 8'; 12', or to order. Strong ribbed rails.
Ask for Folder No. 1251
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MFGRS. OF WHEEL & ROLLER GRAVITY & LIVE ROLLER CONVEYORS • POWER BELT CONVEYORS • SWITCHES • ACCESSORIES • REEL BOLLIES & END-WOOD WHEELS.
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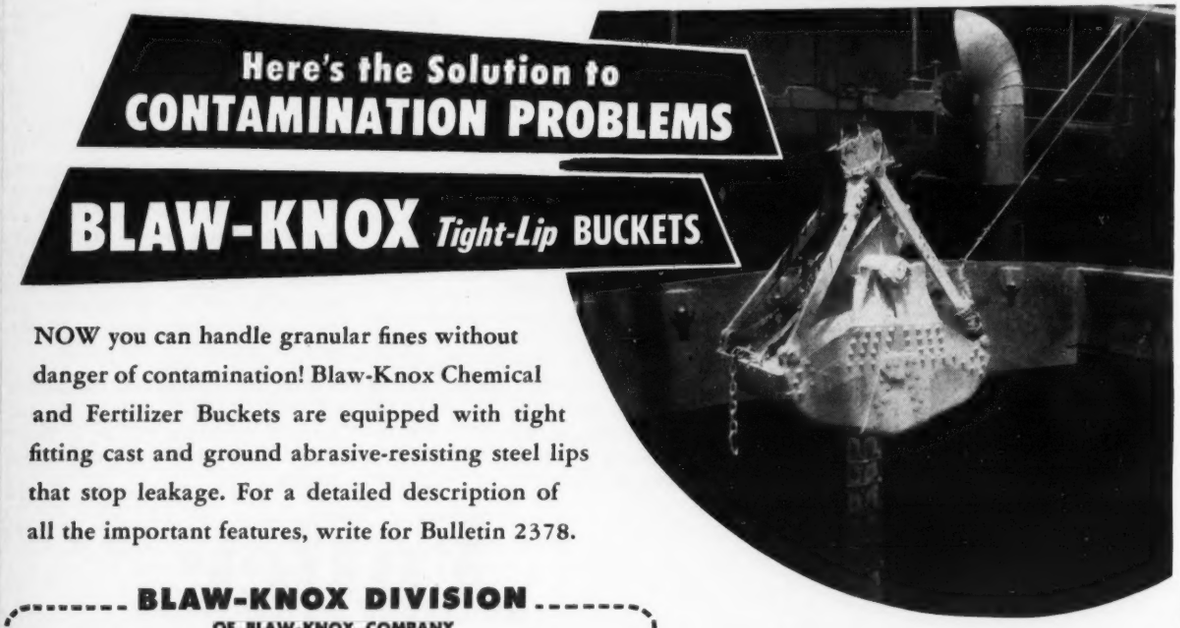
When inquiring check CP 2483 on handy form, pgs. 2-3


Here's the Solution to
CONTAMINATION PROBLEMS
BLAW-KNOX Tight-Lip BUCKETS
NOW you can handle granular fines without danger of contamination! Blaw-Knox Chemical and Fertilizer Buckets are equipped with tight fitting cast and ground abrasive-resisting steel lips that stop leakage. For a detailed description of all the important features, write for Bulletin 2378.
BLAW-KNOX DIVISION
OF BLAW-KNOX COMPANY
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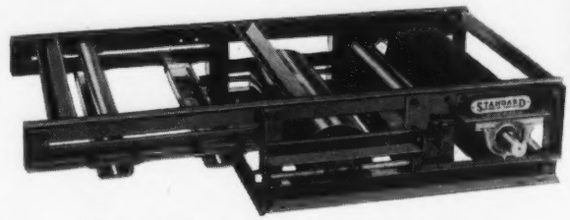
New York • Chicago • Philadelphia • Birmingham • Washington • San Francisco
BLAW-KNOX CLAMSHELL BUCKETS
FOR CHEMICAL AND FERTILIZER PLANTS
THERE'S A SIZE AND TYPE FOR EVERY NEED:
Bauxite • Cement Clinker • Gypsum Rock • Plaster Rock • Limestone • Kainit & Manure Salts • Magnesite • Milorganite • Muriate of Potash • Phosphate Rock • Potash • Pyrites • Super Phosphate • Sodium Nitrate • Sulphate of Ammonia • Ilmenite • Sulphur, etc.

When inquiring check CP 2484 on handy form, pgs. 2-3

Pulls 7½ tons on 150' belt conveyor by reducing friction to a minimum . . .

in many applications, unit eliminates necessity for engineered redesign for efficiency

Heavier design of the Handidrive 1000 permits a 1000-lb belt pull as compared to the 400-lb limitation of an earlier model, the "400." This belt pull should not be confused with the 15,000-lb total load capacity on a belt conveyor 150' long. Design of the newer model embodies standardization of drives, take-ups, end roller assemblies, intermediate frames, bearings, rollers, and



Will pull a 7½-ton total load on 150' belt conveyor

support. Precision bearings are used at all drive and take-up shafts to reduce friction to a minimum. Unit is adaptable for making custom-built conveyors from stock units, and in many applications the model will give the same efficiency that heretofore required complete engineering design.

(Development of the Standard Conveyor Co., Dept. CP, North St. Paul 9, Minn. . . . or for more information check CP 2485 on handy form, pages 2 and 3.)

Hydraulic standards now in 9th edition with new, revised information

Publication of the 9th edition of "Standards of Hydraulic Institute," which provides authoritative information of interest to purchasers and manufacturers of hydraulic pumps has been announced. In addition, it is believed to be the only complete source of detailed engineering information concerning frictional resistances to flow of liquid in pipes.

New edition contains much new information as well as an amount of revised material to keep engineers up-to-date with modern procedures in the hydraulic field.

For copy of "Standards of Hydraulic Institute" remit $3.00 to the Hydraulic Institute, Dept. CP, 122 E. 42nd St., New York 17, N. Y.

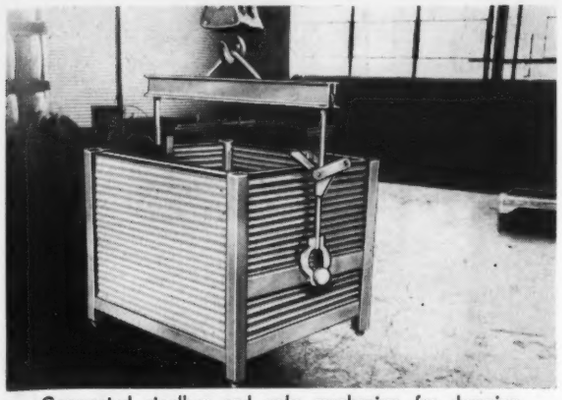
Dumping of plant scrap speeded with special box and yoke arrangement . . .

quick-acting lanyard releases holding "fingers" to overturn load instantaneously

Uses: For dumping of collected scrap in the plant.

Features: Portable unit consists of a corrugated steel box and yoke for handling by crane or hoist. When load has been transported and lifted overhead to the dumping point, lanyard is pulled, lifting the "fingers" off the locking bar. Because of the low position of the pivot blocks and low gravitational center, the box automatically overturns and discharges the load.

Description: Standard size box is 36 x 42 x 30" deep with a capacity of 32 cu ft. Other sizes are available on order. The yoke is lowered over the box and lifting eyes



Corrugated steelbox and yoke mechanism for dumping of plant scrap

of the yoke slip over pivot blocks on the sides of the box. Trip fingers on the yoke drop over a bar end welded on the box to prevent the box from tipping.

Construction is of heavy corrugated steel with welded square steel tube frame. Nesting caps on the feet make it safe and easy to stack boxes, full or empty, to any height to conserve floor space. Casters may be specified if desired to facilitate mobility around machines where there is not room for a lift truck.

(Development of Equipment Mfg., Inc., Dept. CP, 21550 Hoover Rd., Detroit 5, Mich. . . . or for more information check CP 2486 on handy form, pages 2 and 3.)

Compact powered hand truck moves skids, skid bins in close areas with ease . . .

with platform 11″ high, 26½″ wide, and 42″ long, model has capacity of 7500 lb

This extra-heavy-duty low-lift platform powered hand truck is designed for the horizontal transportation of skids and skid bins and has a capacity of 7500 lb. Called the Worksaver, it has an 11″-high platform with 3″ of lift. For operation on ramps, it has 5″ of under-clearance. Platform is 26½″ wide. Standard platform length is 42″, but other lengths are available. Raising of the platform does not increase its overall length, making it suitable for operation in confined spaces.

Powered hand truck has 7500 lb capacity

(Development of the Yale & Towne Mfg. Co., Dept. CP, Philadelphia 15, Pa. . . . or for more information check CP 2487 on handy form, pages 2 and 3.)

Laborer. . . 1952 MODEL

No matter how good a man may be with a hand shovel and wheelbarrow, his production is many times greater as a "PAYLOADER" pilot. What's more — both he and his boss are happier because they both make more money.

In hundreds of fertilizer and chemical plants "PAYLOADERS" have taken over unpleasant, laborious material-moving chores — saving time, cutting costs and increasing production. They scoop up, carry, dump, spread and stockpile all kinds of materials such as fertilizer, chemicals, coal, coke and ashes . . . lift, push . . . spot and unload box cars and do many other cost-cutting jobs . . . release manpower for more productive work.

Every "PAYLOADER" is a complete Hough-built tractor-shovel designed specifically for tractor-shovel work, with multiple reverse speeds, large pneumatic tires and other features that insure fast, low-cost performance over floors or unpaved ground, up and down ramps, through congested areas. The "PAYLOADER" is sold by a world-wide Distributor organization with complete service facilities and seven sizes are available from 12 cu. ft. to 1½ cu. yd. bucket capacity. The Frank G. Hough Co., 744 Sunnyside Ave., Libertyville, Illinois.

JOB STUDIES are available without cost or obligation. Each one is a detailed, authorized word-and-picture report of "PAYLOADER" performance in a specific plant. A request on your letterhead is all that's necessary.

SAY "HUFF"

PAYLOADER

THE FRANK G. HOUGH CO. Since 1920

When inquiring check CP 2488 on handy form, pgs. 2-3

CONSULT P-S FOR THE BEST
Materials
HANDLING EQUIPMENT
Custom Built To Meet Your Needs

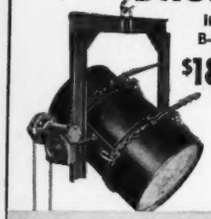
BARREL and BOX SKID
All steel-welded construction—light weight. Will stand up under the heaviest barrel or box. Skid measures 14" wide overall.
All Steel

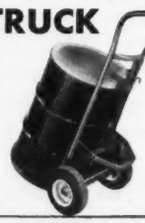
Item B-470

Combination
TRUCK and DRAIN RACK

Loads Automatically
Moves barrels or drums, also serves as drain rack. Two styles—with or without detachable handles. Sturdy frame-welded construction. Weight approximately 90 lbs.
Item NS-506 $46.75
(Handles welded to frame)
Item NS-506 DH $48.95
(Detachable handles)

Vertical DRUM LIFTER
For handling open and closed steel drums in vertical position, by crane or hoist. All-steel, with heavily welded chain. Sure-hold safety barrel grip. Saves plant space. Use for either high or low ceiling condition.
Item C-465
$30.25

DRUM and BARREL TILT

Item B-731
$181.50
A barrel tilt for controlled, precision dumping or pouring. Ideal for chemicals, solvents, powders, etc. Turns 360° through worm drive.
Equipped with two safety type locking devices and all-steel, welded yoke. Hand-operated chain drive.

BARREL TRUCK
It Loads Automatically. Three style wheels: metal, rubber or metal and pneumatic. Capacity 1000 lbs. 22" wide for narrow openings. Weight 85 lbs.

Item S-911M metal wheels $36.85
Item S-911R molded on Rubber Wheels $42.35
Item S-911P Pneumatic Rubber Wheels $49.50

WHEN ORDERING always give "item" number. ALL PRICES are f.o.b Detroit.
Prices subject to change without notice. Write for catalog.

DESIGNED AND MANUFACTURED BY
Palmer-Shile Co.
16016 FULLERTON AVENUE, DETROIT 27, MICHIGAN

When inquiring check CP 2489 on handy form, pgs. 2-3

Lift truck operator is protected from tumbling loads above by rigid guard . . .

attached to lifting mast, device does not interfere with removal of batteries

Overhead guard, securely mounted on lifting mast, is designed to protect operators of manufacturer's Yank and Yak lift trucks. An outstanding feature of the canopy, designated as SA-1484-89-10, is that it permits easy removal of batteries. Overhead guard is pivotally attached to the lifting mast and also pivotally supported from the lift truck dash. This method of securing permits the guard to remain horizontal, regardless of the degree of lifting mast tilt. Canopy has an overall installed height of 95 inches but it may be reduced to 91 inches.

Overhead canopy provides safety for lift truck operator

(Product of the Mercury Manufacturing Co., Dept. CP, 4044 S. Halstead St., Chicago 9, Ill. . . . or for more information check CP 2490 on handy form, pages 2 & 3.

Check-chart presents five steps in battery maintenance

Two-color check-chart tabulates procedures to follow in five basic maintenance operations for batteries, and shows how often each should be done. Chart is 17 x 32 inches and designed to improve maintenance of motive power batteries. Cartoon illustrations accompany rules to follow in charging, adding water, keeping records, cleaning, and safe handling of batteries. Value of chart lies in conserving battery power, standardizing and assuring continuous battery care, and as training aid to new maintenance men.

Check-Chart GB-1448 is issued by Gould-National Batteries, Inc., Dept. CP, Stone and Calhoun Sts., Trenton 7, N. J. When inquiring specify CP 2491 on handy form, pages 2 and 3.

Sand, waste, other bulk material is handled in 80 cu ft loads on lift truck dump . . .

two-ton capacity platform truck uses elevating mechanism to empty load from hopper

A 4000 lb capacity high-lift platform truck with an extra-large 80 cu ft end-dumper hopper has been designed for handling bulky loads of loose material such as sand, gravel, aggregate, sawdust, waste, metal chips, ashes, and scrap. Hopper can be tilted downward to scoop up loads, or it can be loaded from overhead. Truck is standard 4000-lb

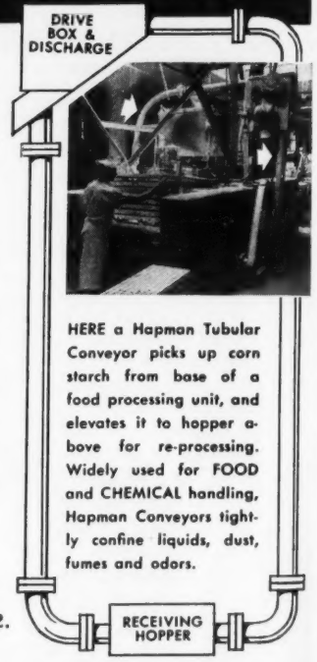
EXIT

THE SHOVEL...
ENTER
THE Hapman
Sealed-pin Chain, Neoprene-flighted
TUBULAR CONVEYOR
for low-cost handling of bulk flowable materials—wet or dry

"Shovel labor" costs *plenty* — so do safety hazards and confusion caused by heavy aisle traffic. But there's a better way — the *Hapman Way!*

By handling innumerable bulk materials with Hapman Tubular Conveyors, you can slash these costs — and increase safety and efficiency! Can you handle metal chips from machine tools? *Yes!* Flour? *Yes!* Abrasive or corrosive chemicals? *Yes!*

Get details NOW — write Hapman, describing your problem. Ask for Bulletin CP-552.



HERE a Hapman Tubular Conveyor picks up corn starch from base of a food processing unit, and elevates it to hopper above for re-processing. Widely used for FOOD and CHEMICAL handling, Hapman Conveyors tightly confine liquids, dust, fumes and odors.

Hapman CONVEYORS, INC.
DIVISION HAPMAN-DUTTON COMPANY
KALAMAZOO MICHIGAN

When inquiring check CP 2492 on handy form, pgs. 2-3.

End-dump hopper has 80 cu ft capacity

electric high-lift platform truck to accommodate the hopper. Platform elevating mechanism is used to dump hopper. (Development of the Yale & Towne Mfg. Co., Dept. CP, Philadelphia, Pa. . . . or for more information check CP 2493 on handy form, pages 2 and 3.)

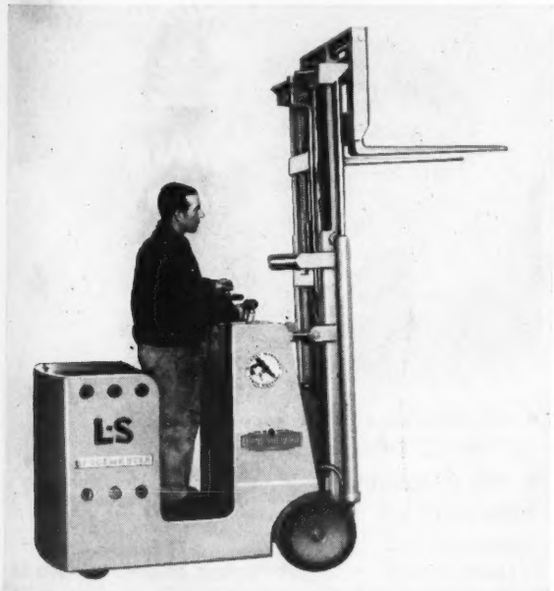
More pep, less radius featured in electric fork truck for warehouses . . .

has no grease points and no under-truck adjustments

Uses: For lifting, moving products on docks, warehouses.

Features: Spacemaster 59 has extra pep in lifting (50 fpm loaded) and requires only 59" turning radius for maneuverability in narrow aisles. Manufacturer reports it has absolutely no grease points nor under-truck adjustments.

Description: Truck has 1500-lb capacity, with stand-



Lifts loads at speed of 50 fpm

up drive. Hauling speed is 6 mph. (Product of Lewis-Shepard Products, Inc., Dept. CP R-2, Watertown, Mass. . . . or for more information check CP 2494 on handy form, pages 2 and 3.)

MORE ROUND TRIPS

...with safety and savings

A Hackney 2-Piece Acid Drum will keep coming back for refills long after you would expect to retire a conventional 3-piece constructed container. That's because it is built stronger to last longer. Just look at these outstanding advantages, and see for yourself:

I-Bar Rolling Hoops—two 1" x 1½" hoops take the handling shocks—protect seam and bung from damage.

Heavy Forged Spuds—attached by a two-pass weld—minimize bung failures.

Reinforced Chime Protectors—add extra strength and life.

Two-Piece Construction—eliminates chime and longitudinal seams. Formed from two seamless, cold drawn shells, joined by a single circumferential weld.

Controlled Heat-Treating—relieves weld and forming stresses—increases resistance to corrosion.

Smooth Interiors—free from crevices, cracks and scale—are always easy to clean.

Choose Hackney 2-Piece Acid Drums for safe, low-cost shipments of sulphuric acid, aqua ammonia, caustic potash, hydrofluoric acid or other special chemicals. Write for full details.

Pressed Steel Tank Company

Hackney MILWAUKEE

Manufacturer of Hackney Products

1463 S. 66th Street, Milwaukee 14 • 1387 Vanderbilt Concourse Bldg., New York 17 • 235 Hanna Bldg., Cleveland 15
936 W. Peachtree St., N.W., Room 126, Atlanta 3 • 208 S. LaSalle St., Room 796, Chicago 4
568 Roosevelt Bldg., Los Angeles 17

CONTAINERS FOR GASES, LIQUIDS AND SOLIDS

When inquiring check CP 2495 on handy form, pgs. 2-3

PATENTS PENDING
outwears chain drives 10 to 1
This sealed gear drive guarantees much longer life for the Hydrolectric. Requires little maintenance . . . and only minimum attention. The sealed Gear Drive in the Hydrolectric Lift Truck is Stuebing engineered to give maximum service life without fuss or bother. This exclusive feature eliminates the main cause of excessive repairs and costly down-time in truck operation. All gears and running parts are sealed in lubricant. It is the widely accepted automotive type differential gear drive.
Over 1071 different types, sizes and models — there is one for every need.
LIFT TRUCKS INC. THE STUEBINGS CINCINNATI
LIFT TRUCKS INCORPORATED
2423-31 SPRING GROVE AVE. CINCINNATI 14, OHIO

When inquiring check CP 2496 on handy form, pgs. 2-3

MATERIAL HANDLING

Operator can uncouple conveyor chain in 5 sec . . .

180° turn can be made within inside radius of 3 inches

Uses: Chain is used with case and can conveyor systems.

Features: Operator can couple or uncouple sections with no tools in less than 5 seconds, owing to transverse "T" one-piece connecting lug between double "U" shaped links. Chain can make a 180° turn within a theoretical 3″ inside radius.

Description: Adapted for use with standard curve wheels ranging from 6 to 42″ in diam, chain C-S 7 is all-steel, with a case-hardened wearing surface to increase wearing resistance. Links have a 3″ pitch; connecting lug is of high tensile (forged) steel alloy.

Coupled, uncoupled without tools in 5 sec

(Development of Conveyor Specialties, Dept. CP, 666 E. 3rd St., St. Paul, Minn. . . . or for more information check CP 2497 on handy form, pages 2 and 3.)

Provides mobile lifting and pulling power in- or outdoors . . .

furnishes line pull of 500-1500 lb; is easily set up for use

Uses: Operating drag lines; providing power for cranes, hoists and derricks on shipping and receiving docks; operating conveyors; truck winch for loading and unloading heavy, bulky materials; power unit for freight and materials elevators.

Features: Powerful, compact; adaptable to on-the-spot use wherever power is needed, indoors or out.

Description: Stampco Tugger, a portable electric winch, is powered to furnish a line pull of 500-1500 lb at speeds ranging from 55-220 fpm. Double reduction spur gears, especially fabricated from high tensile steel, convert the output of a high torque, repulsion-induction motor to a constant speed and power ratio on the drum of the winch.

Reducer is coupled directly to the motor and is totally enclosed to per-

When inquiring check CP 2498 on handy form, pgs. 2-3

When inquiring check CP 2499 on handy form, pgs. 2-3

Save Labor

THIS WAY

OLD WAY--Three Men

NEW WAY--One Man

SABIN
One-Man
BARREL
TRUCK

ONE MAN and a Sabin Truck can easily handle loads up to 800 pounds and faster, too, than with one or two helpers and an ordinary truck.
OPERATION IS SIMPLE. You run truck up to container, hook on at top, and pull back on handle to pick up load.
Third Wheel Feature ensures better balance when traveling with load, and adds to safety.

WRITE FOR BULLETIN NO. 48-A

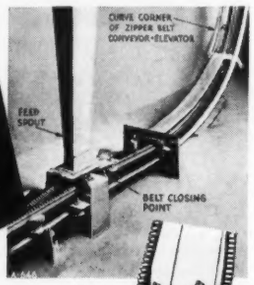
The Sabin Machine Co.
6534 Carnegie Avenue
CLEVELAND 3, OHIO

Type "L-3"

When inquiring check CP 2500 on handy form, pgs. 2-3

S-A

"ZIPPER" BELT CONVEYOR-ELEVATOR



Handles Dry Bulk Materials

without SPILLAGE . CONTAMINATION . BREAKAGE

● Conveys - elevates in any direction, without agitation. Belt *zips* closed for dust-tight protection. *Zips* open for fast loading and complete discharge. Many arrangements, for long or short hauls.

Handles up to 840 cu. ft./hr. at belt speeds up to 200 ft./min.

SEND FOR DETAILS Today!

STEPHENS-ADAMSON MFG. CO.
Standard Products Division
11 Ridgeway Ave., Aurora, Ill.

May I have your bulletin No. 349 on S-A "Zipper" Conveyor Elevators.

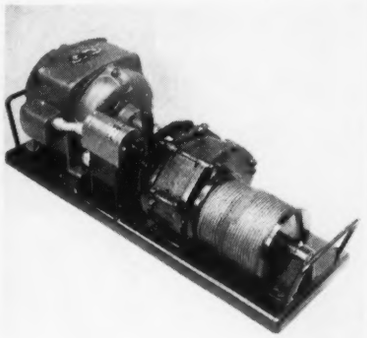
Name_____
Company_____
Address_____
City_____ Zone____ State_____

When inquiring check CP 2501 on handy form, pgs. 2-3

MATERIAL HANDLING

mit higher gear efficiency and quiet operation while running in a continuous oil bath. A conveniently placed lever handle controls mechanical brake and reversing switch on motor.

Tugger is available in 6 models and capacities, with either single, or 3-



Portable electric winch is ready to use wherever power is handy

phase dual-voltage motors, and can be set up, ready to operate wherever an electrical outlet is handy.

(A product of St. Anthony Machine Products Co., Dept. CP, 2424 E. Franklin Ave., Minneapolis 6, Minn. . . . or for more information check CP 2502 on handy form, pages 2 and 3.)

Specs and performance of cycling jet pump

Four-page bulletin reviews operating features of cycling jet jump. Transfer of fluids is accomplished by air, gas, or steam under pressure. Pump operates at pressures of 30, 50, and 80 psi. Pumping capacity ranges from 10 to 37 gpm, depending upon discharge pressure. Over-all height of unit is 38¾"; diameter receiver is 18" ID; and fluid connections are 2" NPT.

Pump may be used for transfer and recirculation of pharmaceutical products, dyes, slurries, petroleum products, etc. Sectional illustrations and brief descriptive material serve to explain operating prinicple of pump. Various parts of unit are broken down in pictorial review. Performance data of pump are presented in table form, and the assorted parts are also tabulated.

It is stated that pump will handle any liquid that will flow through pipe lines. According to bulletin, unit may be used with corrosive and viscous liquids as well as fluids with solids in suspension. Form No. 51121 is issued by Penberthy Injector Company, Dept. CP, 1242 Holden Ave., Detroit 2, Mich. When inquiring specify CP 2503 on handy form, pages 2 and 3.

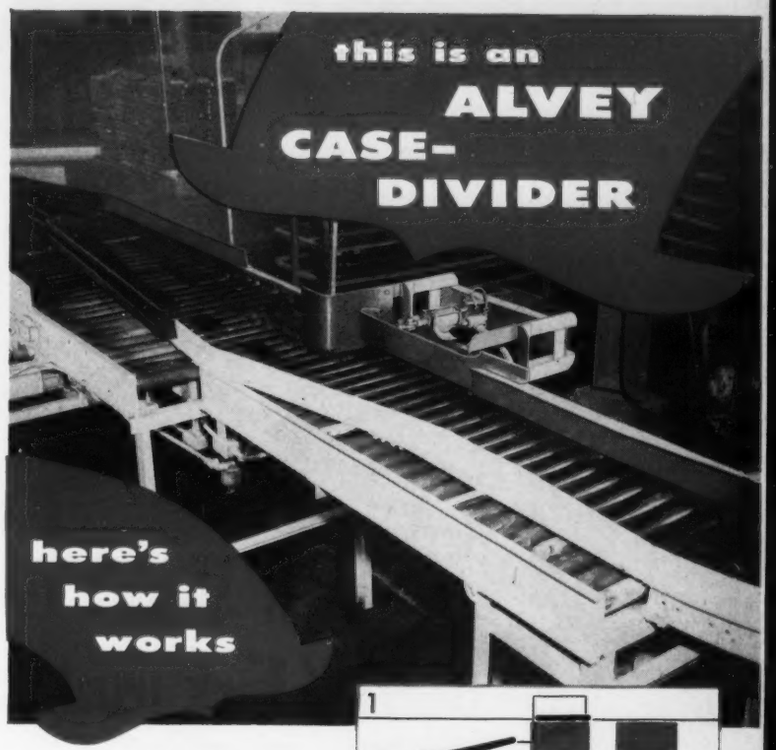
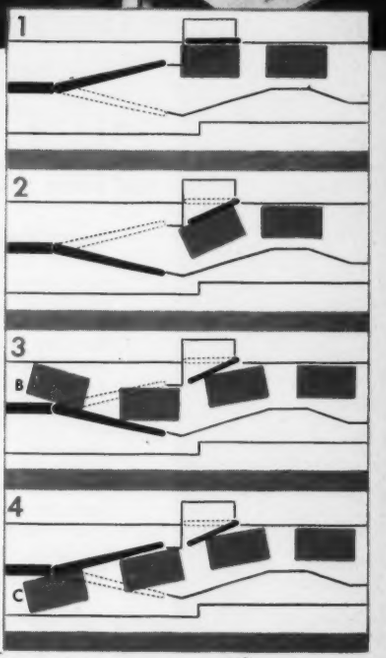


Diagram 1 shows the entry line stopped.

Diagram 2 shows the entry line released.

Diagram 3 shows packages being directed to Line B.

Diagram 4 shows packages being directed to Line C.



These units are built to suit the special requirements of each job and are completely automatic. An Alvey Engineer will be glad to explain the Divider, in detail.

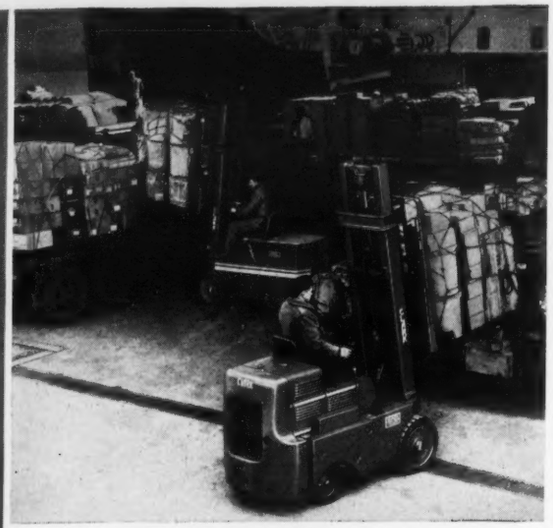
use ALVEY Engineered

Manhandling adds to the cost of your product.

PACKAGE CONVEYING

ALVEY CONVEYOR MFG. CO.
9308 Olive St. Road, St. Louis 24, Mo.

When inquiring check CP 2504 on handy form, pgs. 2-3



"Hitch" Your CLARK Fork Trucks TO THESE Star Attachments

Every CLARK fork-lift truck saves money—
—a *lot* of money—for its user. Some save more than others because they are used more effectively — more efficiently — more regularly. They aren't allowed to stand idle "in between jobs." Demountable CLARK attachments enable them to do at great savings many jobs outside the popular concept of materials handling (snow plowing, coal shoveling and plant maintenance work, for example), and to do more and better jobs within that concept. Let CLARK help *you* make the most of and get the most from *your* fork-lift trucks. For your profit's sake, talk over your handling operations with the CLARK dealer nearest you—he's listed in the Yellow Pages of your telephone book.

CLARK ELECTRIC AND GAS POWERED FORK TRUCKS
AND POWERED HAND TRUCKS · INDUSTRIAL TOWING TRACTORS

INDUSTRIAL TRUCK DIVISION • CLARK EQUIPMENT COMPANY • BATTLE CREEK 9, MICHIGAN
Please send: ☐ Basic Facts Book. ☐ Condensed Catalog ☐ Material Handling News ☐ Have Representative Call.
Name_____
Firm Name_____
Street_____
City_____ Zone____ State_____
AUTHORIZED CLARK INDUSTRIAL TRUCK PARTS AND SERVICE STATIONS IN STRATEGIC LOCATIONS

When inquiring check CP 2505 on handy form, pgs. 2-3

MATERIAL HANDLING

Lightweight hand truck supports 28 times its 16 lb . . .

with load capacity of 450 lb, has removable stair climbers

Uses: For transporting crates, cartons, etc., around the plant in loading or unloading or for storage.

Features: Fabricated completely of magnesium and weighing only 16 lb, hand truck has rated load capacity of 450 lb. Has removable stair climbers.

Description: Model 12-A-800-SC features mechanically joined, standard parts and assemblies. Stair climbers have been designed as standard, interchangeable units, easily replaced when required. Aircraft-type frame construction is combined with engineered weight distribution for greater ease of operation and better balance.

Weighs 16 lb, but can carry 450 lb

(Development of Magline, Inc., Dept. CP, Pinconning, Mich. . . . or for more information check CP 2506 on handy form, pages 2 and 3.)

Bags are held in place by gripping device when filling . . .

self-locking mechanism can hold 50, 80, or 100 lb loads

Uses: For filling bags with bulk commodities — foods, chemicals, etc.

Features: Self-locking device is designed to suspend 50, 80, and 100 lb multi-wall paper bags. When releasing a filled bag, a semi-circular release bar is pushed up, releasing the cams and allowing the bag to drop to a conveyor or skid.

Description: Self-locking Cam-Grip comprises a bag-holding mechanism

"Stop-Go" FLOW CONTROL FOR BINS, HOPPERS, TANKS, ETC.
with TELLEVEL Bin-Level Control

Mount a TELLEVEL near the top and another near the bottom of your storage bin . . . As the material-level falls or rises, the light pendant is pushed aside . . . Automatically *starts or stops* conveyor, elevator or pump . . . Can be furnished for bulk materials or liquids.

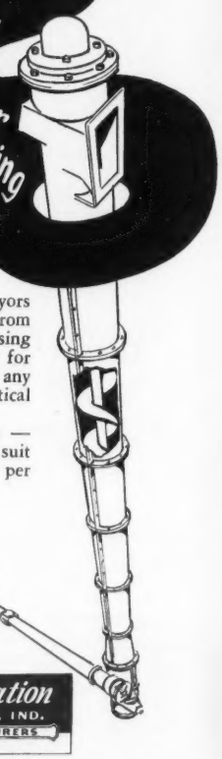
Rising Level of Material Tilts Float-Ball and Stops Conveyor

Write for TELLEVEL Bulletin No. 1048.

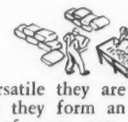
STEPHENS-ADAMSON MFG. CO.
Tellevel—Bin Level Controls · Car Loaders · Saco Speed Reducers · SealMaster Ball Bearings · Car Pullers · Winches
11 RIDGEWAY AVE., AURORA, ILLINOIS

When inquiring check CP 2507 on handy form, pgs. 2-3

Screw-Lift Will Untangle The Snarls In Your Bulk Material Handling



You can cut handling costs — Speed Up Work — Prevent Delays — Simplify Production Flow — by installing "HAMMOND" Screw-Lifts
These ruggedly built tubular Conveyors handle any free-flowing bulk materials from receiving point to storage or to processing machines and then to automatic scales for packaging or bagging. They convey any distance horizontally and to any practical height.
No exposure — no dust — no noise — no contamination. Built in sizes to suit your capacity from 75 to 3000 cu. ft. per hour.



Learn how versatile they are — how nicely they form an integral part of your processing procedure. Write for Form M-500-2

Screw Conveyor Corporation
699 HOFFMAN ST. HAMMOND, IND.
ENGINEERS HAMMOND MANUFACTURERS
TRADE MARK REG. PRODUCTS U.S. PAT. OFFICE

When inquiring check CP 2508 on handy form, pgs. 2-3

Use Self-Dumping Containers

Step-Up

PRODUCTION

50%

SAVE TIME and LABOR

with

ROURA Self-Dumping HOPPERS

Imitated by Many—
Not Equaled by Any

—they pay for themselves

Only ROURA Has the Exclusive Instant Release (Patent Pending) Handle

Handling wet or dry, hot or cold, bulky materials quickly and easily, the ROURA is simple to operate—only one man is required for distributing and unloading—and he does this in much less time than ordinarily required under old-fashioned manual methods. Thousands of Roura Hoppers (which fit any standard fork or platform lift truck) are in constant daily operation, serving and saving for such firms as Owens-Illinois Glass, Corning Glass, National Fireproofing, General Motors, Ford, Chrysler, American Brake Shoe, General Electric, Westinghouse, Western Electric, American Steel Foundries, International Harvester, John Deere, etc.

By a simple lift of the exclusive release handle, the ROURA HOPPER dumps, rights and locks itself securely. Sizes—½, ¾, 1, 1½ and 2 cubic yards; the ROURA HOPPER can also be designed for flat trucks and in other sizes to meet specifications. Also, it can be equipped with special flanges that permit stacking to desired tiers for storage or future distribution of materials—conserving valuable floor space. Priced below all competition, the ROURA will quickly pay for itself many times over.

—Can Be Coated With Acid-Resistant Paints

Write today for detailed brochure, "In Dollars & Sense."

ROURA IRON WORKS, Inc.

1413 Woodland Ave. Detroit 11, Mich.

When inquiring check CP 2509 on handy form, pgs. 2-3

mounted on a spout which the user bolts to the hopper or bin outlet. Empty bags are simply slipped over the mouth of the spout and up under the cams.

The positive grip of the cams holds the bags in place while filling. The cast-iron spout is secured to the hopper

Holds 50, 80, or 100 lb loads when filling bags

or bin outlet by forming a flange at the outlet and then bolting or welding the top of the Cam-Grip spout to this flange.

(Product of the Richardson Scale Co., Dept. CP, Clifton, N. J. . . . or for more information check CP 2510 on handy form, pages 2 and 3.)

Picture story tells uses of power conveyors

Pictorial story of wide variety of uses of manufacturer's power conveyors in industry is told in 2-color, 32-page bulletin. Many materials handling operations in diversified industries are covered with illustrations and explanatory captions to show most efficient arrangement of power conveyors.

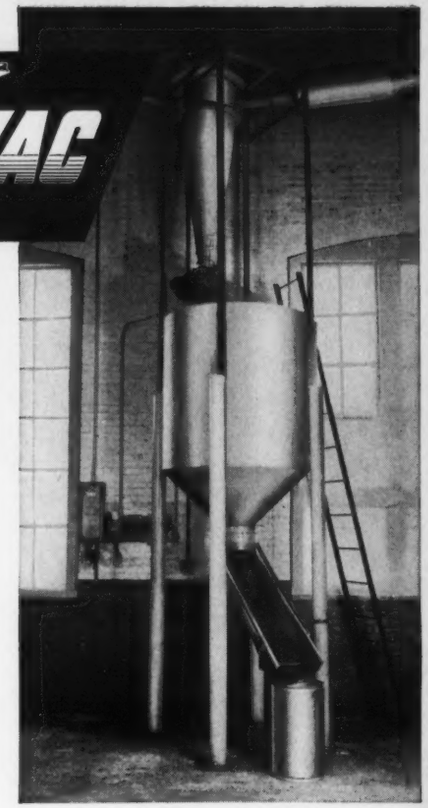
Bul 302 is issued by the Harry J. Ferguson Company, Dept. CP, 149 W. Ave., Jenkintown, Pa. When inquiring specify CP 2511 on handy form, pages 2 and 3.

PNEU-VAC

Sprout-Waldron Pneumatic Conveyor . . .

Steps up plastic granulating production

53%



PLACE: *The Anaconda Wire & Cable Company plant at Hastings-on-Hudson, N.Y.*

PROBLEM: To convey granulated plastic material from a granulator discharge hopper to a packing area...to remove heat generated by the granulator, thus preventing adhering granules from producing a lumpy product. Normal capacity desired—1,000 lbs./hr.

OPERATION: Plastic sheets are fed into a high speed rotary granulator where they are cut into small cubes. At this point, cubes drop into chamber directly under revolving blades, are picked up by a Sprout-Waldron PNEU-VAC pneumatic conveying system. They are then lifted to a storage bin by air, screened to eliminate fine slivers, and finally bagged for storage.

RESULT: The continuous removal of the material from the granulator prevents machine from over-heating, thus making it possible to maintain full production. Prior to the PNEU-VAC INSTALLATION, top granulated capacity was 650 lbs./hr.

With this new Sprout-Waldron pneumatic conveying system, production *has been increased 53%.*

Perhaps your conveying problem is also a "natural" for PNEU-VAC. But, regardless of your immediate needs, you should investigate this new, low-cost and efficient method for handling materials by air.

Write Sprout-Waldron & Company, Inc.,
10 Logan Street, Muncy, Pennsylvania

SW SINCE 1866

SPROUT-WALDRON

PNEUMATIC CONVEYORS

249

When inquiring check CP 2512 on handy form, pgs. 2-3

Fire Hazards of Benzene and Derivatives Minimized by Air Foam System

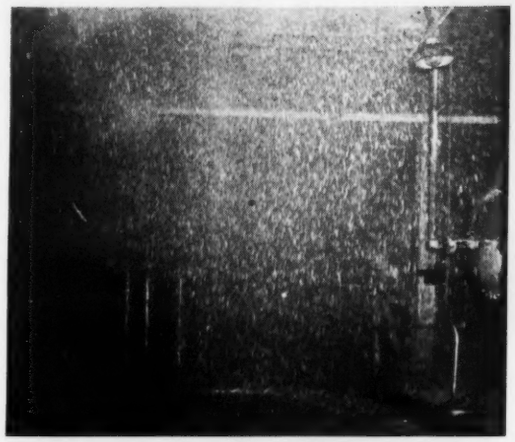
Solvay set-up combines advantages of automatic sprinklers, water spray, and foam fire protection

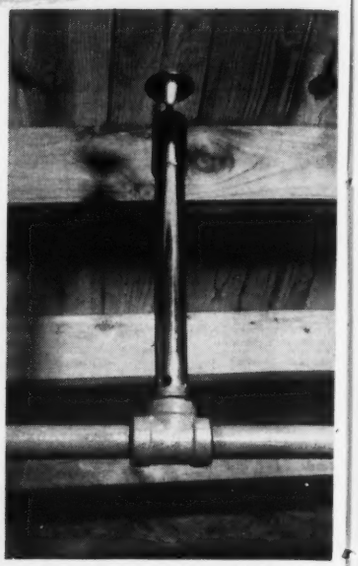
A new "air foam" system has recently been installed as fire protection at the Syracuse, N. Y., plant of The Solvay Process Division, Allied Chemical & Dye Corporation. It is in the company's chlorination and distillation buildings where benzene and benzene derivatives are processed. The system combines the advantages of automatic sprinklers, water spray, and foam fire protection.

Principle depends on integration of deluge sprinkler equipment and a foam injection system. Foam discharge outlets are located in accordance with Underwriters' requirements for automatic sprinklers. However, water pressure at the outlets is maintained at 50 psi instead of the 7 to 8 psi normally maintained on deluge sprinkler systems. The higher pressure breaks up the water to the fineness of water-spray discharge.

System operation is started by rate-of-rise heat detectors, which cause opening of the deluge valve in the water supply line and permit injection of foam liquid stabilizer into the sprinkler system riser. The mixture of foam stabilizer and water is then aerated into a tenacious fire-fighting foam at the discharge outlets of the system. An alarm sounds in the event of fire, and also in cases where the fire protection equipment happens to be mechanically injured in any way.

Air foam is discharged at the rate of 2.0 gpm per sq ft, equivalent to a floor depth of about 3 inches per minute. Sufficient foam liquid stabilizer is available to permit normal operation for 10 minutes, after which water spray will discharge from the outlets for as long as desired, still providing effective fire protection above the foam blanket. The water spray also aids in clean-up because it washes away foam clinging to the ceiling and the processing equipment.





Sprinkler operates effectively with either water or foam discharge

●

Air foam discharge at start of operational and approval tests

●

Thirty seconds after system starts to operate, ditches are filled with air foam

★

The foam stabilizer system is connected to hydrant stations and can be extended to other buildings if desired.

Though primarily applicable for installation in buildings housing processing and pumping equipment, air foam systems are ideally suited to combat fires anywhere that flammable liquids with flash points lower than 150° are used. A mechanical foam stabilizer, capable of producing an alcohol-stable foam, is available for use with the equipment.

(Air foam system was engineered and installed by "Automatic" Sprinkler Corporation of America, Dept. CP, Youngstown 1, Ohio . . . or for more information check CP 2514 on handy form, pages 2 and 3.)

SAFETY FOR YOUR MEN...
VALUE FOR YOU
with
U. S. NEOPRENE GLOVES

They help prevent costly accidents. • They withstand gasolines, oils, greases, and corrosive chemicals such as sulphuric, chromic, and muriatic acids, caustic and plating solutions. • The rough-surface fingers assure positive easy gripping. • They're comfortable because the curved finger construction conforms to the natural curve of hand, eliminates straining and pulling. Highly flexible, they permit easy, natural working motions. These "U. S." gloves withstand tough service. Full range of sizes, lengths and weights. "U. S." technical men will be glad to analyze your glove needs and recommend the correct glove for *your* job.

U.S. INDUSTRIAL GLOVES

UNITED STATES RUBBER COMPANY

When inquiring check CP 2513 on handy form, pgs. 2-3

Indicates accident-prone workers are "triggered" off by autocratic bosses . . .

when this kind of supervisor transferred, accident rate drops; but increases in new department

In an attempt to better understand the human element in accidents, a division of the University of Chicago interviewed, over a period of years, a representative group of accident-prone employes. It also studied the leadership attitudes of the supervisors. The results of the study indicate that the accident-prone workers interviewed seemed to be "triggered" off by autocratic supervisors.

The company which cooperated with the research was a manufacturing plant in the Midwest with about 6000 employes. The overall safety record was good; however, two departments had excessively high accident rates — four to five times as many as compared to the plant average. From a group of 129 accident-prone workers in these departments, 20 were chosen to be interviewed. A control group of 20 accident-free employes was picked and matched with the experimental group on the basis of race, education, occupation and department.

Interviews were about one hour in length and were divided into three phases: 1) discussion of employe's general attitude toward safety; 2) a period of frustrating the employe by misinterpretation of his statements and interruption as he attempted to clarify; and 3) a tension releasing period where the employe could say whom or what he thought responsible for accidents.

Following behaviorisms were disclosed by the accident-prone group during the various phases: 1) they paraphrased safety slogans accurately enough but showed contradictory personal behavior in their actions with regards safe procedures; 2) they adjusted poorly to the frustration period — backing down on statements, falling asleep, and various other regressive attitudes; and 3) they felt accidents were often "just fate" or their own and other employe's horesplay.

Investigation of 28 supervisors from the two departments took the form of a survey test of leadership attitudes. Of the four styles of leadership measured by the particular scale used, these 28 individuals were found to be significantly high in autocratic and significantly low in democratic leadership attitudes. Follow-up work shows that where this kind of supervisor is transferred the accident rate drops and begins to increase in his new department.

One case suggests that a supervisor may be high on autocratic scores without increasing accidents if he is not also low on the democratic scale. Or, in other words, just being autocratic does not seem to cause accidents if the supervisor is fairly close to his employe group as shown by the high democratic scores.

(From study by Industrial Relations Center, University of Chicago, 5801 S. Ellis Ave., Chicago, Ill.)

File presents working operation of gasoline torch

Ten-page publication describes operating features of gasoline hand cutting torch. File shows how the torch works with step by step tour from lighting torch on through the various cutting stages. Subhead facts include: 1) engineering principle behind operation of torch, 2) applications of liquid gasoline principle, 3) economies and safety features of equipment, and 4) comparative oxygen consumption figures.

"File Facts" is issued by Steel News Industries, Inc., Dept. CP, R D 2, Canonsburg, Pa. When inquiring specify CP 2515 on handy form, pages 2 and 3.

A serious fire, yes, but no "total loss"—thanks to the protection of adjacent equipment by smothering blankets of water from a

BLAW-KNOX AUTOMATIC FOG SYSTEM

Actuated by rate-of-rise thermostats, this system sounds an alarm and instantly throws a dense, quenching fog of water on the danger spot—either extinguishing or controlling the blaze while protecting adjacent equipment.

A Blaw-Knox System engineered for the fire hazards existing in or around your plant is a most effective weapon against fire's toll. Your insurance savings as they accrue applied to its cost—provide you with the utmost in fire protection plus a good financial investment . . . Glad to consult with you and submit an estimate without obligation.

Deluge Systems, Wet Pipe Systems, Dry Pipe Systems, Water Spray and Fog Systems, Rate-of-Rise Sprinkler Systems, and Foam and Carbon Dioxide Extinguisher Systems.

"LITTLE JOEY SPRINKLER"
Always on the Job

BLAW-KNOX SPRINKLER DIVISION
of BLAW-KNOX CONSTRUCTION COMPANY
829 Beaver Ave., N.S., Pittsburgh 33, Pa.
Offices in Principal Cities

BLAW-KNOX AUTOMATIC FIRE PROTECTION SYSTEMS

When inquiring check CP 2516 on handy form, pgs. 2-3

"HORSE AND BUGGY"

fire protection is not enough today!

The modern chemical plant is a marvel of technological development. Automatic machines process all kinds of products with unbelievable speed and efficiency.

But the more highly developed the production process, the greater the value of equipment. And the higher the production rate, the more vital the need for continuous, uninterrupted operation.

That's why old-style, make shift fire protection methods should have no place in industry today!

Automatic Sprinkler 10-Point Fire Protection **is as modern as your newest production equipment. It's scientifically engineered to prevent fire damage to your most costly processing apparatus. It employs the most positive, fastest-acting fire detection devices, and the most effective extinguishing methods. It counters every fire hazard in your plant which, unheeded, might lead to disastrous shut-downs.**

The whole story is told in straight-forward terms in our new book "The ABC of Fire Protection". Write for your copy today.

"AUTOMATIC" SPRINKLER CORPORATION OF AMERICA
YOUNGSTOWN 1, OHIO
OFFICES IN PRINCIPAL CITIES OF NORTH AND SOUTH AMERICA

"Automatic" Sprinkler

FIRST IN FIRE PROTECTION

When inquiring check CP 2517 on handy form, pgs. 2-3

Clamp holds material in place as blade is lowered . . .

cutter's accuracy assured by sliding, adjustable gage

Uses: Cutting of paper, rubber, plastics, and other light materials.

Features: Accurate cutting to specification assured by means of adjustable sliding gage. Safety spring holds blade up, prevents accidental dropping.

Description: Jacques, Jr. cutter is of all metal construction. Upper knife and clamp are supported on a shaft having oversized bearings and fitted in housing securely welded to frame.

Material to be cut is held securely in place by a clamp which comes down as the blade is lowered. Clean, accurate cuts are assured by a spring tension device which exerts even pressure against entire area of the knife blade as it cuts through material and meets guide. Cutting action is stated to have a self-honing effect.

Table model Jacques, Jr. is available in 12, 16, 20, 24, and 30" sizes.

(Other details may be obtained from Hobbs Manufacturing Co., Dept. CP, 26 Salisbury St., Worcester 5, Massachusetts . . . or for more information check CP 2518 on handy form, pages 2 and 3.)

Flush-with-ceiling fan makes quick work of fumes . . .

36-inch model rids area of 12,400 cfm, motor is enclosed

Uses: For exhaust uses in workrooms, laboratories, etc., where corrosive fumes are being handled.

Features: Model MDA is installed flush with the ceiling. In largest size, 36", fan has delivery of 12,400 cfm.

Description: Motor is totally enclosed and mounting is concealed by the ceiling. Base plate and fan blade are only things visible from the room.

Ranging in blade size from 14 to 36", fans have motors in various current characteristics and horsepower in proportion to blade size. Fourteen-inch model has cfm delivery of 1585. When corrosive fumes are being handled, fan can be obtained with acid-resisting varnish, capable of withstanding alkali and fumes in moderate concentration, manufacturer reports.

(Product of Herman Nelson Div., American Air Filter Company, Inc., Dept. CP, Moline, Ill. . . . or for more information check CP 2519 on handy form, pages 2 and 3.)

STOP ACCIDENTS with BRADY SAFETY SIGNS

Here's an AMAZING BRAND NEW SAFETY SIGN that will be welcomed by Safety Men! Brady Safety Signs stick to wood, glass, metal, concrete, etc. without moistening. May be applied to any clean surface in a jiffy. No screws, nails, bolts or skilled help necessary. All you do is peel from card, apply where wanted and the sign is up to stay.

Brady Safety Signs are made of durable cotton cloth, Silicone Coated to resist dirt, grime and moisture. CONFORM TO ASA Standard Z35.1-41. Select your requirements from a complete catalog of standard safety messages. Cost only a few cents per sign. Immediate delivery. Specials made to order.

WRITE FOR Free SAMPLES AND USEFUL CATALOG

WIRE MARKERS
PIPE MARKERS
SAFETY SIGNS
PRINTED ROLL TAPE
MASKS & STENCILS

MANUFACTURERS OF SELF-STICKING PRODUCTS

W. H. BRADY COMPANY

EST. 1914

1635 E. SPRING STREET • CHIPPEWA FALLS, WIS.

When inquiring check CP 2520 on handy form, pgs. 2-3

TRICO

"KLIPLOK" CLAMPS and "POWDER-PACKED" FUSES

Save
- POWER
- FUSES
- CLIPS

CUT MAINTENANCE COSTS

The PERFECT Combination that INSURES peak production

"KLIPLOK" CLAMPS

"Lock Like A Vise" and "stay put". There's no chance for faulty contact between fuses and clips when "Kliploks" are applied.

"KLIPLOKS" Reduce

- Premature Fuse Blowings.
- Unnecessary Shutdowns.
- Lost Production.
- Unnecessary Repairs.
- Doubling-up Fuse Links.
- Fire & Accident Hazards.

"Powder-Packed" RENEWABLE FUSES

The ONLY fuse with a "Custom-built" . . . "Powder-Packed" renewal element . . . literally a FUSE WITHIN A FUSE that provides:-

- Three Times The Fuse Service
- Low-resistance Contacts
- Tamper-proof Protection
- Guaranteed SAFE Time-lag
- Link Protection & Support
- Lifetime Outer Parts

WRITE FOR BULLETINS No. 1 & 6

TRICO FUSE MFG. CO. Milwaukee, Wis.

When inquiring check CP 2521 on handy form, pgs. 2-3

Plastic spray makes windows resistant to shattering, at low cost . . .

tests indicate plastic film holds nearly all fragments in place after rawhide mallet blow

A practical, inexpensive way of making shatter-retardant glass from ordinary window glass has been successfully tried by General Foods' Post Cereals Division in Battle Creek, Mich. Double-strength glass is sprayed with a liquid plastic material. After drying, the coated glass has been found to hold together much better than wire-glass when struck a blow: the latter showered the area with powdered glass and slivers when struck with a rawhide mallet, but the plastic of the former retained all but a very small trace of glass. Controlled testing — for five months — has shown that the plastic coated glass retains its original safety qualities for at least that long.

The plastic liquid used is Liquid Envelope Permanent Clear D2089. It was applied to the inside of the glass by a DeVilbiss NBC-62746 spray gun and 30-psi air pressure.

Cost of applying two coats to a 14 by 20" pane was only 1c for labor and 1½c for material.

The Post Cereals Division has sprayed all windows in the head houses of its grain tanks, and also some additional areas in strategic spots in processing locations where contamination of food might occur if the windows happened to be broken.

(The above information is based on article appearing in Vol. 6 No. 1 of the "GF Technical Bulletin," published quarterly by General Foods.)

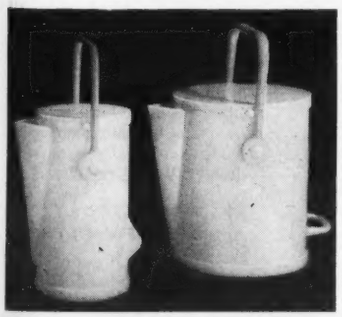
(Liquid Envelope Permanent Clear D2089 is a product of Better Finishes & Coatings, Inc., Dept. CP, 270 Doremus Ave., Newark, N. J. . . . or for more information check CP 2522 on handy form, pages 2 and 3.)

Non-breakable polyethylene jugs are light, non-corrosive, cut spill hazard . . .

fabricated material is rigid, but only 1/3 the weight of glass, 1/13 the weight of lead

Uses: As containers for moving or handling smaller quantities of corrosive chemicals in various laboratory or industrial operations.

Features: Lightweight (1/3 that of glass, 1/13 that of lead) safety jugs will not break or crack, offer excellent resistance to most alkalis and acids, including hydrofluoric acid. The jugs, made of polyethylene, are designed to greatly reduce hazards of spilling or splashing corrosive liquids. Escape of liquid is limited to the spout.



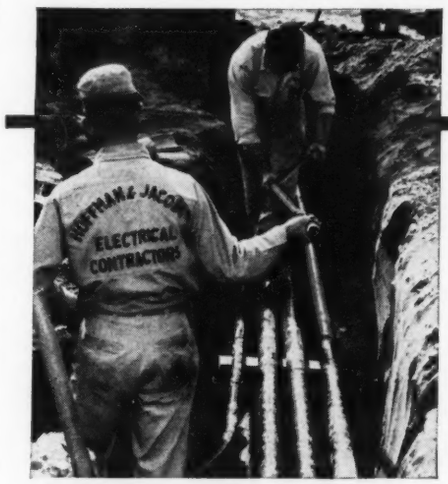
Jug does not crack or break

Description: Agilene Safety Jugs are available in standard sizes of 1½ and 3½ gal and weigh 4½ and 5¾ lb respectively.

(Product of the American Agile Corp., Dept. CP, P.O. Box 168, Bedford, Ohio . . . or for more information check CP 2523 on handy form, pages 2 and 3.)

SINGLE WRAP application solves CORROSION PROBLEM

MAN AND MULE. Whether Polyken 882 is applied by hand or by an electrically operated "pipe mule" (as shown here) it wraps quickly and economically, producing an even, wrinkle-free coating.



WRAPS UP THE JOB at the job-site. Polyken 882 protects electrical conduits on new pier for Long Beach Harbor Department.

One protective coating of Polyken replaces multiple packs, wraps and coatings on underground conduits.

Hoffman and Jacobs, Long Beach, California, are wrapping several thousand feet of underground conduits on huge new Pier D. Where they formerly used three layers—felt, tar and paper—they now do the job easier, faster and more economically with single-wrap, Harbor Dept. approved, Polyken 882.

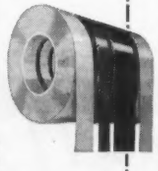
This established protective coating is the only pressure-sensitive tape made from oriented polyethylene, a material long recognized for its excellent anti-corrosion characteristics.

Polyken 882 is
- elastic
- stretches to conform to odd shaped surfaces
- corrosion-proof
- moisture-proof
- fungus-proof
- solvent resistant

No. 882 is only one of hundreds of Polyken tapes engineered to save you time and money. Send in coupon today for free brochure and samples.

TAILORED TO YOUR JOB

Polyken®



INDUSTRIAL TAPES

Department of Bauer & Black
Division of The Kendall Company

Polyken, Dept. CPE
222 West Adams St., Chicago 6, Illinois

Please send specifications, samples and brochure on Polyken No. 882.

Name_____ Title_____

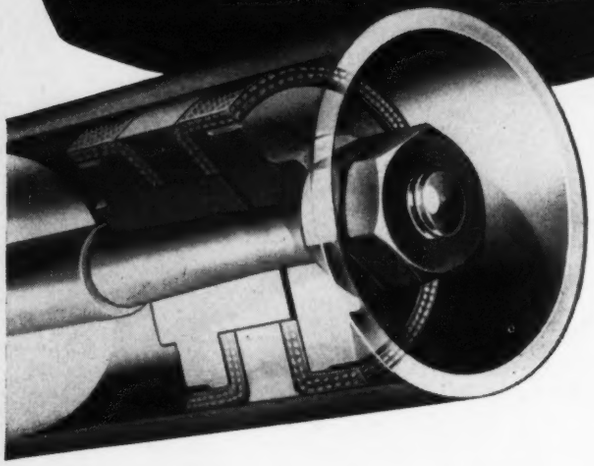
Company_____

Street Address_____

City_____ Zone_____ State_____

When inquiring check CP 2524 on handy form, pgs. 2-3

YOU GET higher efficiency WITH DARCOVA PUMCUPS ON THE JOB!



THERE are two basic, well-proved reasons why more and more Darcova Pumcups are going into cylinders of air and hydraulic controls and mechanisms.

First, texture-engineered Pumcups outlast most other piston packings at least 3 to 1. There's less replacement, less down-time!

Secondly, efficiency *does not diminish* as Pumcups wear. Response is always faster, surer, with less power consumed!

Darcova Pumcups are available in sizes and engineered textures ideal for virtually any service. Why not find out what they can save *you?*

ASK FOR BULLETIN No. 4502

DARLING VALVE & MANUFACTURING CO.

Williamsport 4, Pa.

DARCOVA — THE ORIGINAL COMPOSITION CUP

PUMCUPS

When inquiring check CP 2525 on handy form, pgs. 2-3

SAFETY

Prevents light bulbs from shattering when broken . . .

clear lacquer coating outlives fluorescent tubes

Uses: As an anti-fragmentation coating for light bulbs and tubes to prevent shattering from breakage.

Features: When clear lacquer type coating is applied to fluorescent tubes or other "cold" light tubes or bulbs, they remain shatter proof even after the life of the tube is gone.

Description: Clear Tecogel (CL-32) anti-fragmentation bulb coating is shipped in a solid form to be melted in a water bath. Bulbs are dipped and then dried for two or three hours. For additional life, the coating should be dried for approximately 48 hr. On light bulbs of higher wattage the coating tends to discolor after prolonged exposure, but most users of this type of bulb usually replace them periodically.

(Product of Thompson and Company, Dept. CP, Oakmont, Pa. . . or for more information check CP 2526 on handy form, pages 2 and 3.)

Non-clogging spray nozzle puts out fires with fog . . .

uses spiral principle for atomizing mist

Uses: For industrial processing and fire protection.

Features: Fog nozzle is of stainless steel, resists corrosion, and is non-clogging. Uses spiral principle of atomization.

Description: Series AA are available in six models, three flow rates (1 to 10 gpm range), and with a full or hollow cone fog pattern. A ¼" male pipe thread connection is standard, with a ⅜" pipe thread available on special order. Nozzles can be cleaned without removing them from the installation.

(Product of the Bete Fog Nozzle, Inc., Dept. CP, 85 Pierce St., Greenfield, Mass. . . . or for more information check CP 2527 on handy form, pages 2 and 3.)

Readers of CHEMICAL PROCESSING are invited to submit concise briefs of their processing problems. With your permission these will be published (anonymously, if desired). We will place you in contact with any of the 33,000 people receiving CP who offer a solution.

ACME . the Only Gas Mask With the "PICTURE WINDOWS"

You never have that "jammed-in" feeling, wearing the Acme Full-Vision Gas Mask. Its patented, larger lenses are like picture windows, giving you full natural vision for that safe, unconfined feeling. When you walk, you can actually see your toes without bobbing your head. This factor alone makes Acme outstanding among gas masks . . . well worth looking into.

Write for the complete story on Acme Gas Masks for the chemical industry.

ACME PROTECTION EQUIPMENT CO.

3037 West Lake Street, Chicago 12, Illinois

When inquiring check CP 2528 on handy form, pgs. 2-3

Safety
STEEL STEP LADDERS

FOR EVERY NEED

With safe, sure footing anybody reaches high places easier, with a sense of security that permits complete freedom of action to get the job done. Ballymore Ladders are sturdy and safe, can't roll when in use or kick out, have lots of foot room, strong hand rails. All welded construction. Ball bearing casters permit easy movement without lifting. One to three steps without hand rails. Three to eight steps with hand rails. "Special" models.

WRITE TODAY FOR COMPLETE CATALOG

BALLYMORE CO

WAYNE 10, PA.

When inquiring check CP 2529 on handy form, pgs. 2-3

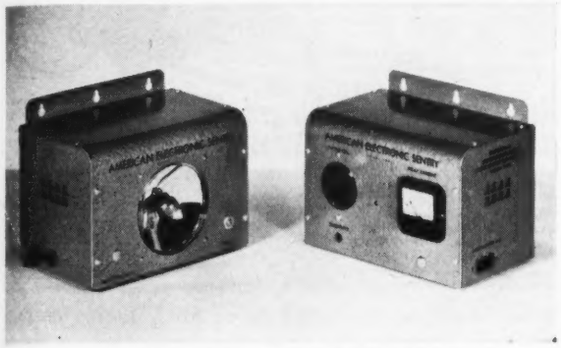
Where there's smoke, unit will tell with electronic detector in critical area . . .

alarm also signals if device is damaged to give double protection against outbreak of fire

Uses: For quick detection of smoke in areas not protected by sprinklers or in sprinkler-protected areas where water damage in fire extinguishing would result.

Features: Reports presence of smoke immediately to central point. Cannot be put out of action since actual damage or sabotage of the unit will set off alarm over power failure or regular alarm circuits.

Description: "Electronic Sentry" unit will protect an area approximately 30 x 150 feet. Larger areas, individual buildings, enclosed drying areas can all be protected through a common annunciator panel. A series of indicating lamps on the annunciator panel indicates the location of the alarm received by the system. Loud exterior alarms or distant interior alarms can be operated from the annunciator panel. Unit, composed of a photoelectric receiver and a light-beam projector, operates on 110v, 60 cps.



Detects presence of smoke in critical areas

(Detector is a product of the Electro-Mechanical Div., American Encaustic Tiling Co., Dept. CP, 901 Kenilworth St., Lansdale, Pa. . . . or for more information check CP 2530 on handy form, pages 2 and 3.)

Lowers bacteria count, cleans equipment for personal safety quickly and sanitarily . . .

dry powder is ready-packaged to insure proper mixture when added to water

Uses: For cleaning personal safety equipment such as face shields, respirators, mask facepieces, ear defenders, clothing, etc.

Features: Cleans and sanitizes equipment quickly and easily. Pre-packed to eliminate guesswork, dry powder mixes with warm water and reduces bacterial count to levels judged safe by public health standards, manufacturer reports. Leaves no soap film.

Description: Cleaner-Sanitizer is packed 25 one-oz envelopes to a carton and is easily stored. User adds one ounce to a gallon of lukewarm water, immerses soiled safety equipment into the solution, and scrubs gently until article is clean. A plain water rinse (about 120°F) is followed by an air dry.

(Product of the Mine Safety Appliances Co., Dept. CP, Braddock, Thomas, and Meade Sts., Pittsburgh 8, Pa. . . . or for more information check CP 2531 on handy form, pages 2 and 3.)

SHIELD *of* MODERN FIRE PROTECTION

TRADE MARK C-O-TWO REG U.S. PAT. OFF.

"headquarters for the finest"

Foremost design, experienced engineering, quality materials, expert workmanship and operating superiority are all bywords of the C-O-Two Fire Equipment Company . . . originators of the world famous C-O-TWO Squeez-Grip Carbon Dioxide Type Fire Extinguishers.

C-O-TWO, being specialists in modern fire detecting and extinguishing equipment for many years, are constantly striving to develop new and improved types of fire protection equipment that will render highly efficient results in safe-guarding life and property from the ravages of fire.

With C-O-TWO Fire Protection Equipment, simplicity, practicability, longevity and minimum maintenance are built-in features that guarantee fast, positive action the instant fire strikes. Furthermore, extensive skill and high quality standards, together with approvals such as the Underwriters' Laboratories, Inc., Factory Mutual Laboratories, Armed Forces and Government Bureaus assure you of the finest in modern fire protection equipment.

Among the many types of up-to-date fire protection equipment manufactured by C-O-TWO, the following comprise the principal items on the market today:

- **carbon dioxide type hand and wheeled portable fire extinguishers**
- **dry chemical type hand and wheeled portable fire extinguishers**
- **carbon dioxide type hose rack and hose reel fire extinguishing units**
- **built-in high pressure carbon dioxide type fire extinguishing systems**
- **built-in low pressure carbon dioxide type fire extinguishing systems**
- **built-in smoke fire detecting systems**
- **built-in heat fire detecting systems**
- **high pressure carbon dioxide cylinder recharging equipment**

So, with current expensive delayed replacements, why not let an expert C-O-TWO Fire Protection Engineer help you now in planning modern, economical, fully approved fire protection facilities for your various properties. Our experience is at your disposal . . . no obligation of course. Get the facts today!

C-O-TWO FIRE EQUIPMENT COMPANY

NEWARK 1 • NEW JERSEY

Sales and Service in the Principal Cities of United States and Canada

Affiliated with Pyrene Manufacturing Company

MANUFACTURERS OF APPROVED FIRE PROTECTION EQUIPMENT

Squeez-Grip Carbon Dioxide Type Fire Extinguishers • Dry Chemical Type Fire Extinguishers • Built-In Smoke and Heat Fire Detecting Systems Built-In High Pressure and Low Pressure Carbon Dioxide Type Fire Extinguishing Systems

When inquiring check CP 2532 on handy form, pgs. 2-3

Here's what you should know about LEAD

Dependable under extremely corrosive conditions . . . under many pressures, concentrations and temperatures . . . lead is the ideal material for handling sulphuric, sulphurous and chromic acids. In the chemical, textile, petroleum and metallurgical industries . . . wherever reliable control of strongly corrosive harsh-acting materials is imperative, lead can be used safely.

For complete technical assistance with your corrosive-handling problem, write to Federated's *Corrosion Advisory Service*. It is at your service. For lead products, use ASARCO Brand lead pipe, lead sheet, and lead fittings. Available in all standard sizes and forms through Federated's 22 sales offices across the country.

Federated Metals Division

Federated first in the non-ferrous field FMD

AMERICAN SMELTING AND REFINING COMPANY • 120 BROADWAY, NEW YORK 5, N. Y.

When inquiring check CP 2533 on handy form, pgs. 2-3

for your New Laboratory, or ...
for Expansion
METALAB offers you
the Finest in
LABORATORY EQUIPMENT
WITHIN YOUR BUDGET
Let Metalab advise you on
• How to plan your Laboratory for greater efficiency.
• How Interchangeable Sectional Units are used.
• How to get the most for your laboratory budget.
Our new modern plant is geared to give you the close cooperation and rapid service you require.
Rush your problems to us today!
Write for our complete catalog on Laboratory Furniture and Equipment.
SECTIONAL LABORATORY FURNITURE and EQUIPMENT by
METALAB
Equipment Corp.

230 Duffy Ave., Hicksville, L. I., N. Y.

When inquiring check CP 2534 on handy form, pgs. 2-3

SAFETY

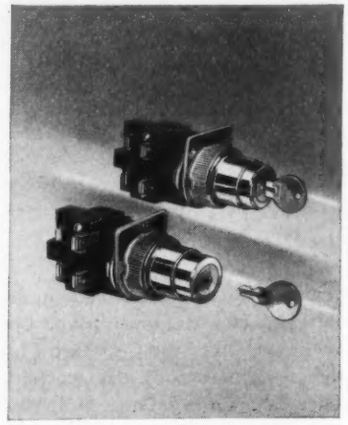
Prevents tampering with electric switches . . .

keys protect cylinder locks in any position

Uses: For locking electric switches in desired position.

Features: Both the pushbutton and selector switch types allow key to be removed in depressed position, undepressed position, or both.

Description: Cylinder locks come in two basic types: selector switch, with either 2 or 3 rotary positions; or the pushbutton type, which can be depressed in either full or intermediate positions. They are mounted in place



Discourages tampering with electric circuits

of the standard operator on Class 15-022 Oil-Tite pushbuttons for panel mounting, or in surface-mounting or flush-mounting stations. All operators of the complete Oil-Tite line are mounted in identical round holes, varying in thickness from 1/16 to 1/4", without requiring an extra gasket. The single- or double-pole contact blocks can be mounted either in the bottom of the box or on the operator.

(Key-operated pushbuttons are manufactured by Westinghouse Electric Corporation, Dept. CP, Box 2099, Pittsburgh 30, Pa. . . . or for more information check CP 2535 on handy form, pages 2 and 3.)

Alkyd finish gives good electrical insulation at temp to 400°F . . .

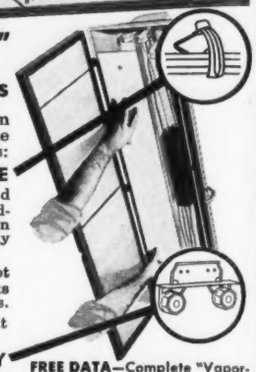
acid, alkali, and organic solvent resistant, good adhesion

Uses: Modified alkyd base finish providing good electrical insulation on metal at temperatures of 400°F.

Features: Has good adhesion to all clean metallic surfaces without resorting to specialized application tech-

BETTER LIGHTING for STEAMY, DUSTY locations

Benjamin "VAPOR-TITE 40" Fluorescent Lighting Units



Three important advancements in these new, improved units enable you to obtain the following benefits:

SIMPLIFIED MAINTENANCE

New Spring-Type Clamps! You need unsnap only three of these new, hand-operated clamps to open the cover. When cover is closed, clamps hold it securely in place to keep out steam, dust, dirt.

Heat, Impact-Resisting Glass Cover, not affected by temperature extremes, cracks only under intense mechanical strains.

Exclusive "Springlox" Lampholders cut relamping time to a few seconds!

INCREASED SAFETY

Lamps are *held in position* by new "Springlox" Lampholders, exclusive with Benjamin. They provide positive assurance that lamps will not vibrate loose.

GREATER EFFICIENCY

High Light Output! Genuine Porcelain Enamel reflector has reflection factor exceeding 82%.

Available for two or three 40", 40-w fluorescent lamps.

FREE DATA—Complete "Vapor-Tite 40" specifications and lighting data, sent upon request. Write Benjamin Electric Mfg. Co., Dept. LL, Des Plaines, Ill.

BENJAMIN "Vapor-Tite 40" FLUORESCENT LIGHTING UNITS

Sold Only Through Electrical Distributors

When inquiring check CP 2536 on handy form, pgs. 2-3

DON'T BE HALF-SAFE

Obtain COMPLETE ELIMINATION

of Offensive Odors and Visible Smoke Plume

from your process by the new, low temperature

CATALYTIC COMBUSTION PROCESS

Installations now cleaning up exhaust fumes from —

Kettle Cooking — Wire Enameling
Paint Baking — Organic Chemicals

And Similar Manufacturing Operations.

BULLETIN B and other technical articles available for distribution — SEND NOW for your copy.

Patents Pending

Catalytic *Fume Incineration for Industry*
COMBUSTION CORPORATION
4545 GRAND RIVER AVENUE DETROIT 8, MICHIGAN

When inquiring check CP 2537 on handy form, pgs. 2-3

LEFAX POCKET SIZE TECHNICAL DATA BOOKS $1 EACH

Printed on loose leaf, six hole, 6¾" x 3¾" bond paper, each book contains about 140 pages of technical data, presenting condensed, accurate and essential data for the student, engineer, technical worker and business man.

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LEFAX Dept. CHP 2 Philadelphia 7, Pa.

When inquiring check CP 2538 on handy form, pgs. 2-3

THE **SAFE** OPEN STEEL FLOORING IS **TRI-LOK**

No object over ½ inch square can pass through super-safe U-Type Tri-Lok Flooring. It is unsurpassed for plant installations, walkways, loading platforms. Maximum strength, air and light with minimum weight. Efficient distribution of concentrated loads.

The Tri-Lok Company is also equipped to furnish *riveted* and Tri-Forge *welded* open steel flooring. Tri-Lok can be furnished in a variety of metals, including aluminum alloy, stainless steel, etc. Write today for Bulletin PB-1103.

DRAVO CORPORATION

National Distributor for The TRI-LOK Company
Dravo Building, Pittsburgh 22, Pa.
Sales Representatives in Principal Cities

When inquiring check CP 2539 on handy form, pgs. 2-3

SAFETY

niques. Finish shows excellent resistance to acids, alkalis, and to most organic solvents. Reported to be hard, abrasion resistant, and capable of with standing vibration.

Description: Insul-Film can be applied to any metallic surface by brushing, dipping, or spraying. Is thinned with toluol or xylol to suit application. Aluminum surfaces should first be zinc chromate primed, or chemically treated to produce an absorbent oxide, phosphate, or chromate surface film. Ferrous metals should be given a phosphate type dip before coating. Cadmium and zinc plated surfaces should be passivated for best adhesion.

Curing should be carried out to obtain best physical, chemical, and electrical properties. A typical convection oven curing cycle is recommended: 1) air dry and then flash at 400°F for 30 minutes, 2) finally bake at 400°F for 30 minutes.

Infrared heating can be used for baking, and a good film can be obtained by maintaining the coated part at a surface temperature of 350°F for 20 to 30 minutes. A flexible baking schedule can be used when a lower temperature cure is desirable. A cure below 150°F is not recommended.

Electrical characteristics:

Temp, °F	Insulation Resistance, v/mil (st puncture)
75	850
400	700

(Product of the Electrofilm Corporation, Dept. CP, 7116 Laurel Canyon Blvd., North Hollywood, Calif. . . . or for more information check CP 2540 on handy form, pages 2 and 3.)

Compact cabinet provides quick cleaning method for goggles . . .

finger-spray unit is equipped with tissue paper also

Uses: For cleaning and fog-proofing safety goggles and glasses.

Features: Compact cabinet is self-contained and has compartments for dispenser, clean tissues, and used tissues. One application cleans and fog-proofs without scratching.

Description: Measuring 6 x 6 x 4" and of steel construction with baked enamel finish, cabinet has lock-on door to eliminate tampering. No air pressure or attachments are needed.

(Sani-Spray Stations are manufactured by the Allen Optical Company, Dept. CP, 85 Allen St., Buffalo 2, N. Y. . . . for more information check CP 2541 on handy form, pages 2 and 3.)

Pyrene® REG U.S. PAT. OFF.

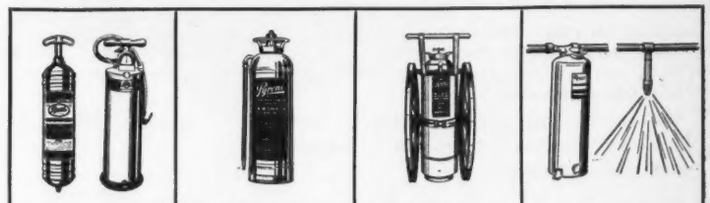
A PYRENE WON'T STOP CARELESSNESS— IT WILL KILL FIRES!

A cardboard locker caught fire in the basement and soon this whole Dayton, Ohio, building was ablaze. Date: January 6, 1950. Loss: $291,500.

There's a Pyrene for every fire hazard

The right extinguisher at the right time can often prevent enormous losses. Whatever your fire hazard, there's a Pyrene* to cope with it—for Pyrene makes everything from hand extinguishers to complete automatic fire-fighting systems.

*T.M. Reg. U.S. Pat. Off.



Vaporizing Liquid	Cartridge-Operated	Chemical Foam	Systems
Most practical for all-purpose use.	For ordinary fires. No annual recharging . . .	For flammable liquids, ordinary combustibles.	Large and small, manual and automatic.

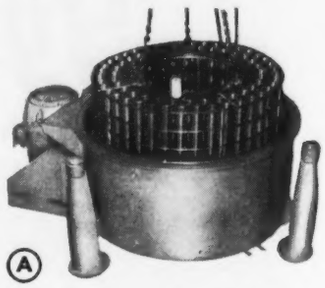
. . . and other approved extinguishers

PYRENE MANUFACTURING COMPANY
691 Belmont Avenue Newark 8, New Jersey
Affiliated with C-O-Two Fire Equipment Co.

When inquiring check CP 2542 on handy form, pgs. 2-3

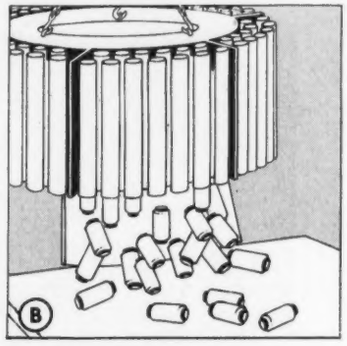
IT'S HERE!

New Bottom Unloading Carrier Cuts Centrifuging Time, Labor and Costs

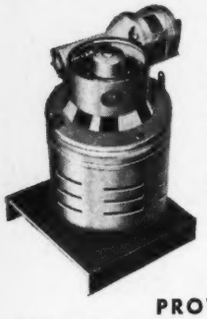


Originally designed for the impregnation of insulating materials, this special AT&M carrier — featuring exceptionally fast, easy unloading — offers new advantages to many processes.

It is incorporated in a link-suspended type AT&M centrifugal, in which a specially designed link guarantees minimum vibration in the foundation, uniform load distribution on the links and smooth operation with "out-of-balance" loads. Optional features include: fume-tight covers for volatile liquids, spray pipes, exhauster connections or removable baskets. Drives are direct-connected or clutch-operated. Speed lock prevents opening of cover until machine is at full stop.



(A) The new AT&M carrier, illustrated, is loaded conventionally, through the top. (B) Unloading is effected through a six-segment trap door in the bottom, eliminating all handling or tipping, reducing the time and trouble of unloading to a minimum, and enabling more cycles per shift.



Another AT&M Advanced Feature

Designed to provide a perfectly controlled, fixed speed essential to the unloading of sticky sludge and many other materials, AT&M's two-motor, free-wheeling drive combines positive operation with maximum safety. Built-in oiling system requires no pumps, or check valves.

You, too, can benefit with AT&M equipment. Does away, in many instances, with settling tanks, filter presses, squeeze rolls, vacuum presses. Used in processes involving chemical preparations — explosives — nitrating — acid wringing — ammonium sulphate — oils and greases — paints, varnishes — ceramics, bricks, clay — fertilizers — nitrates — sludges — textiles — carbonizing (textiles) — plastic bases.

PROVE TO YOURSELF

how centrifuging can benefit you. Send us a sample of your material for centrifuging to your specifications, or rent an AT&M laboratory centrifugal for your own tests at a nominal fee. And send for free booklet today.

FREE Illustrated Booklet

AMERICAN TOOL AND MACHINE COMPANY
1412 Hyde Park Avenue, Boston 36, Mass.

Please send me my free copy of the new AT&M booklet "Centrifugal Force." I am interested in the following processes:

Separation ☐ Extraction ☐ Dehydration ☐ Clarification ☐ Coating ☐ Filtration ☐
Draining ☐ Thickening ☐ Impregnation ☐ Sedimentation ☐

ANY OTHER PROCESS:.....

Name.....Title.....

Company.....

Street.....

City.....Zone.....State.....

SAVE TIME, SPACE AND COSTS WITH **A.T. and M. CENTRIFUGING**

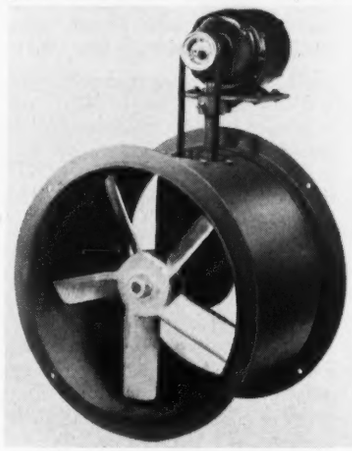
When inquiring check CP 2543 on handy form, pgs. 2-3

SAFETY

Rids areas of vapors or hazardous fumes quickly . . .

exhaust fan motor is outside of air stream

General purpose type fan is designed for exhausting dangerous or obnoxious fumes, dirt, heat and smoke or in other applications where it is desirable to have the motor outside the air stream. Features include SKF sealed bearings in readily replaceable flange construction, double angle motor support to minimize vibration, adjustable



Exhaust fan motor is located outside of air stream

motor base for belt take-up, and heavy cast aluminum fan blade in sizes from 18 to 42".

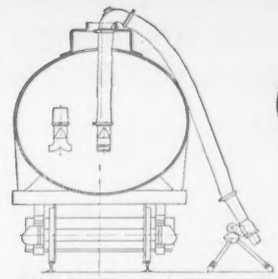
Unit meets UL specifications for spray booths. Explosion-proof, enclosed or open type motors (¼ to 7½ hp) are available. Capacities are up to 30,500 cfm, free delivery.

(Product of the Standard Electric Mfg. Co., Inc., Dept. CP, West Berlin, N. J. . . . or for more information check CP 2544 on handy form, pgs 2-3.)

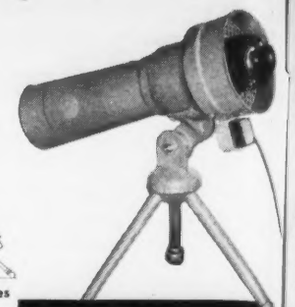
Outlines safety steps in handling $NaClO_3$

Twelve-page safety sheet lists physical and chemical properties of sodium chlorate. Precautionary measures are discussed as well as explosive characteristics of $NaClO_3$ in contact with sulfur, organic, and phosphorous compounds. Bulletin also discusses shipping and handling requirements in compliance with ICC regulations.

Bulletin reviews precautionary disposal measures in addition to safety requirements for personnel. Safety Data Sheet SD-42 is issued by Manufacturing Chemist's Association, Inc., Dept. CP, 15th & H Streets, Washington 5, D.C. When inquiring specify CP 2545 on handy form, pages 2 and 3.



TANK CAR is easily freed of fumes for workers' safety.



CHEMICAL STILL is here ventilated while being repaired.

KEEP AIR FRESH

in confined places with COPPUS *Design "A" Ventilator*

Improve workers' safety — health — comfort — efficiency. Get rid of dangerous gases, fumes, stagnant air. Coppus Design "A" Ventilator ventilates tanks, tank cars, drums, vats, underground cable manholes, pipe galleries, airplane wing compartments, fuselages. For complete information, write Coppus Engineering Corporation, 385 Park Ave., Worcester 2, Mass. Sales Offices in *Thomas' Register.*

Other "Blue Ribbon" Products in *Chemical Engineering Catalog, Refinery Catalog, Best's Safety Directory* and *Mining Catalogs.*

ANOTHER **COPPUS** "BLUE RIBBON" PRODUCT

When inquiring check CP 2546 on handy form, pgs. 2-3

This Revolutionary NEW GRIP-STRUT GRATING

gives MAXIMUM STRENGTH with MINIMUM WEIGHT

RUGGED LOW COST NON-SKID VERSATILE

Not welded. Vertical members joined by integral saddles—side channel members and grating are a single unit—combines great strength with light weight. Simplifies installation—greatly reduces costs of construction. Easily replaces old or obsolete types of grating. Feature for feature, Grip Strut has a lower initial cost factor than any other type. Available in steel or aluminum.

WRITE FOR FULL DETAILS

GLOBE

The **GLOBE** *Company*
MANUFACTURERS SINCE 1914
4006 S. PRINCETON • CHICAGO 9, ILL.

When inquiring check CP 2547 on handy form, pgs. 2-3

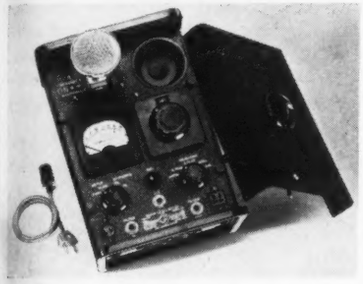
Quickly measures product noises, also aids psycho-acoustic analyzing . . .

using batteries or AC, electronic sound-level-meter is accurate within ± 1 decibel

Uses: For measuring product noise quickly; for studying noise levels in working areas involving worker safety, psycho-acoustic studies, evaluating characteristics of acoustic materials.

Features: Accurate within ± 1 decibel, meter is lightweight and can be used either with batteries or AC power.

Description: Stable circuit of the sound-level-meter uses a two-stage preamplifier as well as a three-stage main amplifier. Overall frequency response of the amplifiers is a flat from 20 cycles to 20 kc so that full advantage can be taken of the new high fidelity microphones. Instruments' characteristics conform to ASA specifications, and direct measurement of sound pressure levels can be made over a range of 24 to 140 db, a power range of 400 billion to 1. Self-contained batteries power the instrument for portable operation, but a small AC power supply is available when continuous use is contemplated.



Basic instrument for sound and noise measurements

The diaphragm-type Rochelle-salt crystal microphone is removable so that it can be placed at the end of a cable, or can be replaced by another microphone with special characteristics. Output from the sound-level-meter is available for operating such auxiliary equipment as frequency analyzers, level and tape recorders, and oscillographs. Type 1551-A sound-level-meter weighs 11 lb.

(Development of the General Radio Co., Dept. CP, 275 Massachusetts Ave., Cambridge 39, Mass. . . . or for more information check CP 2548 on handy form, pages 2 and 3.)

Heat from fire sets extinguisher off automatically . . .

plastic-enclosed sprayer is rust and corrosion-proof to give long life protection

Uses: As protection against fire.

Features: Extinguisher operates automatically and is rust and corrosion-proof. Can also be operated manually.

Description: Measuring approximately 9″ long and 5″ in diam, fire extinguisher uses carbon tetrachloride sealed in a glass container. When fire breaks out, heat releases a fusible clip, action of which causes a spring-loaded plunger to smash the glass container, releasing the fluid to smother the fire. Container is encased in either red or ivory colored plastic, ready for immediate mounting. Top cover of plastic enclosure is removable to allow glass bulb of fluid to be thrown manually over the fire.

(Product of Red Comet, Inc., Dept. CP, Littleton, Colo. . . . or for more information check CP 2549 on handy form, pages 2 and 3.)

"Buffalo" Tips on Better Pumping

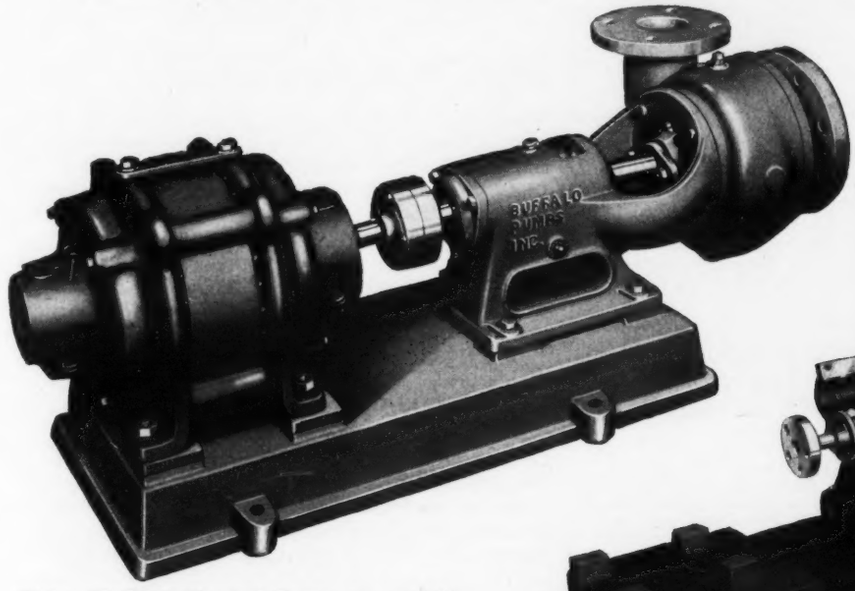
FOR BEST RESULTS,

Include ALL Information In Your Requests For Quotes On Pumps

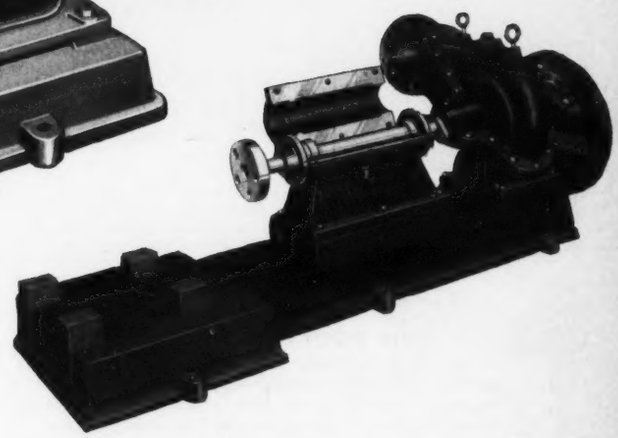
A request containing too little information on proposed pumping job results in one of two things: the supplier has to assume certain facts, or engage in time-consuming correspondence to get those facts. Complete information IN THE BEGINNING assures your getting the right pumps in the shortest time, and often enables the manufacturer to suggest an alternative which is cheaper and more efficient.

This information should include:

1. Description of the liquids: Temperature, corrosive and/or abrasive characteristics, specific gravity, viscosity and vapor pressure under service conditions, and if possible, a chemical analysis. This enables the supplier to recommend the right trim, also the right type and design of pump for the job.
2. Capacity — both operating and maximum — in gallons per minute — so that a pump may be selected within the range of highest efficiency, yet the sufficient margin for safety.
3. Type of drive (direct or belt), and type of driver (engine, turbine, motor).
4. Discharge pressure or head of liquid to be pumped.
5. Suction lift or suction head.



Left—a "Buffalo" Full Ball Bearing Single Suction Pump available in special alloys for the chemicals you handle. Write for Bulletin 976-D for full engineering data.



Right—"Buffalo" Chemical Pumps are available with medium or hard rubber lining, depending on the acid to be handled. Recommended for chlorinated solutions, concentrated hydrochloric, etc. A complete line of chemical pumps is described in Bulletin 982. Write for your copy!

"Buffalo" BUFFALO PUMPS INC.

524 BROADWAY BUFFALO, NEW YORK

Canada Pumps, Ltd., Kitchener, Ont.
Sales Representatives in all Principal Cities

A BETTER CENTRIFUGAL PUMP FOR EVERY LIQUID

When inquiring check CP 2550 on handy form, pgs. 2-3

You can always be sure of a

Sparkling FILTRATE

WHEN YOU USE ERTEL ASBESTOS SHEETS

. . . the accepted standard!

Ten Grades...

1, 2, 3 } Liquid Soaps, Drugs, Viscous Liquids, etc.

4, 5, 6 } Pharmaceuticals, Elixirs Oils, Sweet Wines, Antiseptics

7, 8, 9 } Chemicals, Food Liquids, Whiskey, Wines, Cider, Water, Germproof

E0 Pyrogen & Bacterial Retentive

• Ertel Asbestos Filter Sheets are available for all types of filters using filter disks. Their high quality is recognized by industry as having no equal. We invite you to take advantage of our free offer and see for yourself why Ertel Sheets are the accepted standard.

Free Ertel Sheets for Test in your own plant

In order to determine the exact grade of sheets necessary to meet a particular requirement, tests should be made. The Ertel Laboratory maintains a free test service to determine the grade sheet best suited for your product, and upon determination a sufficient quantity of Ertel Sheets for a single set-up in your filter will be sent you without obligation.

FAMOUS ERTEL HAND CAPPER

Interchangeable chucks permit capping up to 40 mm caps. Ideal for sample lots or where mechanical devices are not applicable.

ERTEL ENGINEERING CORPORATION

KINGSTON 3, NEW YORK

Branch Office & Showroom Located in New York City

COMPLETE LINE OF *Liquid Handling Equipment*

ERTEL

When inquiring check CP 2551 on handy form, pgs. 2-3

Briefs . . . from contemporary publications

Here's a quick look at interesting articles appearing in other publications, . . . as selected by Technical Editor, Harry McCormack

Designing for maintenance

Authors emphasize the importance of consulting the maintenance department when new processing equipment is being designed. Cites the marked rise in cost to replace a part in a unit already installed as compared with the initial cost of a better unit. States that a study of maintenance break-down shows major items are man-hours required to dismantle equipment in an effort to determine why it did not operate satisfactorily and studying operating conditions in order to make proper corrective steps. Comment on utility of setting up standards for equipment. Relate lessons learned in regard to pumps handling corrosive materials. 3 pages, 3 photos. (*"Chemical Engineering Progress," March* 1952, *page* 115)

Liquid industrial wastes; a symposium in which 18 papers are presented

Papers were presented by recognized leaders in the field covered by their papers. Specific subjects; antibiotics, pulp and paper, atomic energy industry, steel industry, citrus fruits, tanneries, corn products, dairy industry, grain distilleries, brass and copper, organic chemicals, packinghouses, petroleum refineries, waste disposal in Britain, sulfuric acid recovery from waste liquors, wastes containing radioactive isotopes, mechanism of methane fermentation. 85 pages, illustrated, tabulated data, graphs etc. (*"Industrial and Engineering Chemistry," March* 1952, *page* 467)

Fabrication of chemical plant in stainless steel

Operations involved in the fabrication of stainless steel chemical plant reviewed. Operations described are: cutting processes, machining, deforming, welding, miscellaneous heat treatment, descaling and finishing. Effect on fabrication of availability of alloys, castings and standard forms are discussed with particular reference to present day supplies and conditions (in Britain). Attempts are made throughout to link fabrication and design so as to point the way to better plants at lower cost. 30 pages, 26 figures, 7 tables, 6 pages of discussion. (*"Trans. Institution of Chemical Engineers," London, Vol.* 27-49, *page* 139)

Thickness of glass electrodes

A non-destructive method has been developed for measuring the thickness of glass electrode bulbs. Is of interest primarily to the manufacturer. Method is simple, rapid and accurate. Investigation revealed that for each glass analyzed, there is a certain "departure thickness"; hence a bulb with thickness equal to or less than this value will give full theoretical response whereas a thicker one will not. Departure thickness is a function of glass hygroscopicity, therefore the greater the hygroscopicity the thicker the bulb may be. 5 pages, 8 figures, 1 table. (*"Journal of Research of the National Bureau of Standards," December* 1951, *page* 443)

Benzene hexachloride determined colorimetrically

A method is described by which trace amounts of benzene hexachloride may be determined. Apparatus reagents and procedure described. Method applied to materials containing known amounts of benzene hexachloride and results tabulated. Method also applied to other chlorinated organic insecticides and the apparent amounts of benzene hexachloride tabulated. 3 pages, 3 tables, 3 figures. (*"Analytical Chemistry," March* 1952, *page* 544)

Distillation of fatty acids by continuous methods

Paper presents some improvements on this process. Discusses the advantages of the process. Schematic drawing shows necessary equipment and how units are arranged. Comment is made on importance of entrainment separation, cooling and condensing fatty acid vapors. Materials of construction are stated; operating requirements are tabulated. Material balances and yields are also tabulated for seven different charging stocks. 7 pages, 8 tables, 6 figures. (*"Journal of American Oil & Chemical Society," March* 1952, *page* 81)

Liquid-solid cyclone sep'n of fine-size materials

Describes a machine and an operating technique for separations as indicated. Operating characteristics were studied and conclusions reached as to slurry concentrations and liquid head. Data supplied upon which calculations can be based to determine number of cyclones required for any desired separation. 14 pages, 13 tables, 12 figures. (*"Chemical Engineering Progress," Feb.* 1952, *page* 75)

Fume control in the varnish industry

Article tells various devices used for this purpose. Describes and discusses specifically a system embodying condensation, wet surface impingement, absorption and chemical reaction. Have been successfully used for alkyd resins, phenolic modified resins, ester gums, japan dryers, regular oils and varnish resins etc. Illustration shows interior arrangement of stationary elements in standard multi-wash collector. 2 pages, 6 photos. (*"Paint and Varnish Production," March* 1952, *page* 22)

An American Fischer-Tropsch plant

Under this title authors discuss the developments and modifications in design and operation of the Bureau of Mines plant at Louisiana, Missouri. Processing described from coal used to synthesis gas produced. Importance of certain processing steps emphasized. Dimensions are tabulated for the various units composing the plant and a similar table supplies data on the heat exchangers. Some runs

made substituting oxygen for air to the gas producer. Analysis of synthesis gas so produced is stated. Performance data given for gasifier and reactor. Utility requirements stated. 16 pages, 5 tables, 10 figures, 11 photos, extended bibliography. (*"Industrial and Engineering Chemistry," March* 1952, *page* 450)

Facts, not fiction about synthetic liquid fuels

Presents the findings of the committees of American Petroleum Institute who studied this question in its many phases, and rendered opinions on: costs of producing liquid fuels, availability of liquid fuels from present sources, possibility of synthetic liquid fuels competing in price with those produced from petroleum. Paper comments more specifically on the economics of coal hydrogenation quoting cost figures reached by Bureau of Mines and by the API committee. 7 pages, 2 figures, 8 tables. (*"Petroleum Refiner," March* 1952, *page* 88)

Adsorption isotherms for pure hydrocarbons

Authors secure certain experimental data from which an equation is developed for calculating the desired isotherm. Equation said to have advantages over both the customary Langmuir and Freundlich equations in that it expresses adsorption data over very wide ranges of temperature and pressure. Indications are that the constant L' and n are independent of temperature. 4½ pages, 7 figures, 3 tables. (*"Industrial & Engineering Chemistry," February* 1952, *page* 383)

Corn syrup analysis involving selective adsorption

Authors describe a chromatographic method for the separation of corn syrups into dextrose, maltose, and dextrin fraction. Necessary equipment and procedures for the separations are described. After separation, customary methods are used to determine percentage of components. Proposed method is compared with Zerban method and results tabulated. 3½ pages, 4 figures, 2 tables. (*"Journal of Research of the National Bureau of Standards," November* 1951, *page* 363)

Instrumentation of oxygen plants

Author draws on experience acquired from the instrumentation of three of the largest commercial units for the material included in paper. States that for maximum operating efficiency, certain temperatures and flows must be controlled. Tells what these are and how they are controlled. Schematic drawing shows equipment arrangement and locations of controls. Drawings show some special equipment. 5 pages, 8 figures. (*"Instruments," March* 1952, *page* 320)

Photometric determination of aluminum in zinc and steel

Conventional gravimetric methods, for the purpose mentioned, are tedious. Method described is as accurate as the gravimetric procedure for zinc is completed in 20 min and for steel in 3 hr — as compared to 8 hr when gravimetric method is used. Reproducibility and accuracy tested against analyzed samples from US Bureau of Standards. 3 pages, 2 figures, 4 tables. (*"Analytical Chemistry," December* 1951, *page* 1806)

traps help uncover hidden steam treasure

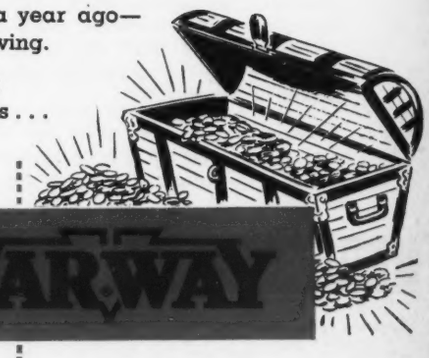
The facts are these:

A large southern chemical company about a year ago was up to capacity on their boilers. New process units were being added, requiring more steam—a new boiler seemed inevitable.

About that time they began replacing their old-type traps and bleed-off valves with Yarway Impulse Steam Traps and Strainers. Today, even with the new process units added, their daily steam consumption is nearly 100,000 lbs less than a year ago—the superintendent gives Yarway Impulse Traps credit for the saving.

Yarway Impulse Traps are *designed* to insure sending the most premium B.T.U.'s at top temperature into your product or process . . . *to get equipment hotter sooner and keep it hot!*

Yarway's have 11 other advantages, too—such as *small size, low maintenance, low cost, and availability* from over 200 Industrial Distributors.
Write for Bulletin T-1740. Or for steam trap advice, call on your nearby Yarway service engineer.



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the steam trap designed with more production in mind

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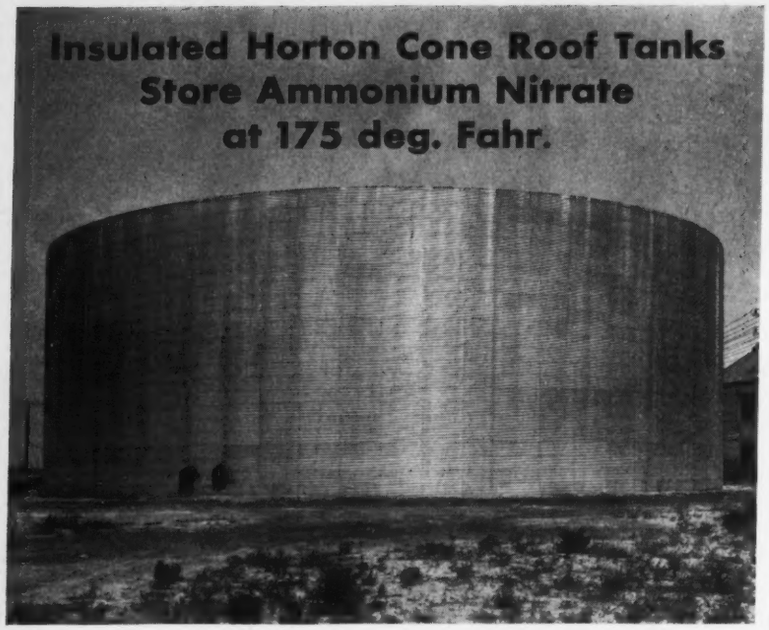

"SPENSOL" trade name for ammoniating solutions manufactured by the Spencer Chemical Company, is used, among other things, as a fertilizer. One of the important ingredients of Spensol is ammonium nitrate. The tank pictured above is one of two 80,000-barrel Horton storage tanks which we built for Spencer Chemical at Charlestown, Indiana to store the 80 per cent ammonium nitrate.

Somewhat unique in chemical storage tanks, these particular Horton tanks are insulated and heated. Ammonium nitrate must be kept stored at a temperature of 165-175 deg. Fahr. in order that the product remain in solution. To assure this, the tanks are insulated with a layer of 1¼ inch of Fiberglas and are heated by circulating the stored solution with Brown fin-tube heaters utilizing steam as a source of heat.

Tanks to store ammonium nitrate represent only one of the many cases where Horton steel structures fill the bill for special storage problems. Chicago Bridge and Iron Company is fully equipped to fabricate and erect structures from either straight metals or from any of the following corrosion-resistant materials for chemical plants.

CLAD STEELS — Chrome-nickel or straight chrome stainless steels, monel or nickel. *LININGS* — Chrome-nickel or straight chrome stainless steel, monel, nickel or everdur. *SOLID CORROSION-RESISTANT METALS* — Chrome-nickel or straight chrome stainless steels, monel, aluminum, nickel or everdur.

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BRIEFS

Ammonium bisulfite pulping

Paper I presents general aspects of the process, states how customary equipment can be used in ammonia process. Digester action commented on and compared with calcium base. Comparative operating conditions and comparative pulp characteristics are tabulated.

Paper II tells some of the experiences in a mill where calcium pulping was replaced by ammonia. 5 pages, 2 tables. (*"The Paper Industry," March* 1952, *page* 1438)

Fundamentals of fluid hydroforming

Paper presents basic principles of this operation: essentially a catalytic dehydrogenation process and to a lesser extent, paraffin isomerization. Fluid hydroformer design is briefly discussed and a drawing depicts the essential component. Yields and product quality are tabulated. Plant investment and required utilities are commented on and items tabulated. 5 pages, 4 tables, 1 figure. (*"Petroleum Refiner," December* 1951, *page* 97)

Color stability tests of clear lacquers

Author presents various tests which may be used to ascertain color stability. Lacquers were nitrocellulose base of various formulations. Effect of temperature on color stability discussed. Results presented graphically. 3½ pages, 9 figures. (*"Paint and Varnish Production," March* 1952, *page* 18)

Lignin-reinforced synthetic and natural rubbers

Paper presents the results of an investigation into the effects of sulfate lignin as a component of the rubber batch. Lignin is co-precipitated with the rubber, and varied quantities are used with each of the rubbers. Rubbers also compounded with customary reinforcing agents, (no lignin) and cured are compared with those in which lignin was present. Results are shown graphically. 5 pages, 19 figures, 6 tables. (*"Industrial & Engineering Chemistry," January* 1952, *page* 163)

Design of fixed bed, catalytic reactors; using generalized graphical method

Method is based on a consideration of the lateral heat and mass transfer occurring in the bed. Is useful for all heat-transfer situations provided some simple symmetry: e.g. cylindrical symmetry may be assumed. Design is based on rate data obtainable from differential reactors giving the reaction rate in terms of the temperature and the fractional conversion of the limiting reactant. 7 pages, 5 figures, discussion. (*"Chemical Engineering Progress," March* 1952, *page* 118)

An approach to continuous Twitchell fat splitting

Author has assembled a wealth of material on the Twitchell fat splitting. Includes description of conventional Twitchell process, with a discussion of the kinetic and equilibrium data required for a mathematical analysis of the process. Presents experimental data when fresh water is used for each stage of a three stage split and for the case where

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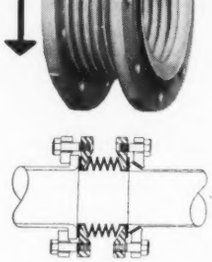

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the same water is used over again for different stages of successive batches. Considers the possibility of operating process as a continuous one, under moderate pressure. 25 pages, 14 figures, 8 tables. (*"Trans. Institution of Chemical Engineers," London, Vol.* 27-49, *page* 123)

Cooling tower design for air conditioning

Author discusses the general considerations in the design of large cooling towers operating in connection with air conditioning systems. Gives details of construction of four specific installations, such as structural and mechanical design selections, materials of construction, and physical proportions. Photos of specific parts expand the verbal description. 6 pages, 3 tables, 7 photos. (*"Heating, Piping and Air Conditioning," January* 1952, *page* 124)

Heat distortion of polystyrene

Authors present the results of an extensive study of the effects of annealing during the conditioning of polystyrene samples prior to physical testing. Annealing variables, time and temperature were varied over a wide range. Effects of an applied load on test bar during annealing was also investigated. 7 pages, 11 figures, 9 tables. (*"American Society for Testing Materials Bulletin," February* 1952, *page* 37)

Silicone rubber

A literature review with 88 references, 5 pages. (*"Rubber Age," November* 1951, *page* 211)

Evaluation of centrifuge performance

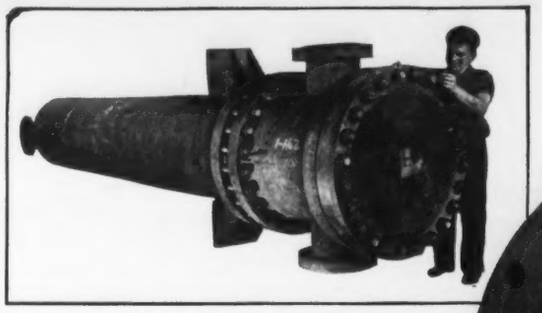
Paper enumerates and comments on types of centrifuges available and ways in which they may be operated. Discusses the factors to be considered in evaluating performance of various types of centrifuges. Some specific problems are discussed. 9 pages, 9 figures, 3 tables. (*"Chemical Engineering Progress," March* 1952, *page* 150)

Lists commercial solvents for cottonseed extraction

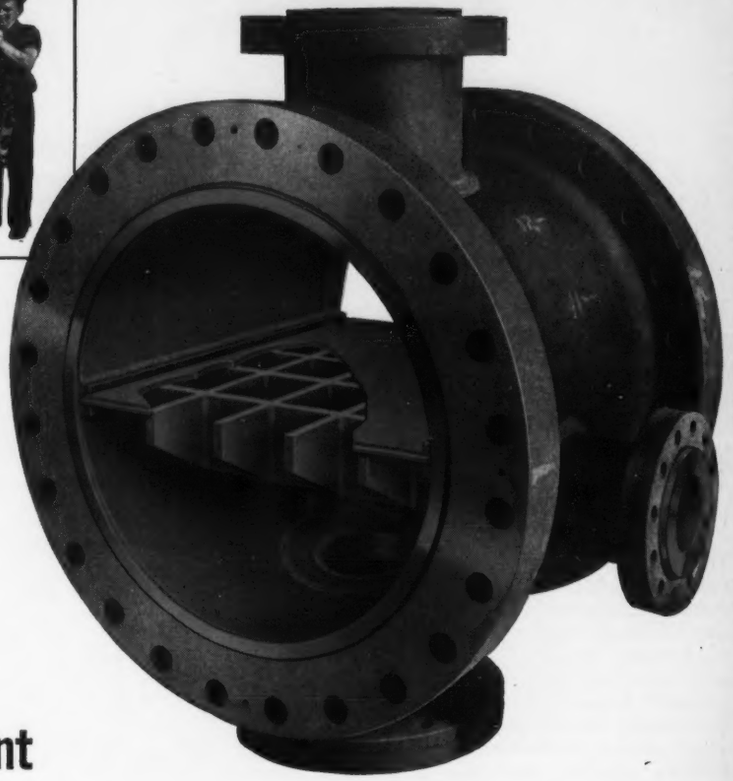
Paper presents the pilot plant results obtained by using five commercial solvents in cottonseed extraction. Experimental procedures are stated and sketch of pilot plant is included. Data is recorded on: ratio of solvent to meal extraction time and temperature, crude oil desolventation, characteristics of meal and desolventized oil. 6 pages, 8 tables, 1 figure. (*"Journal of American Oil & Chemical Society," March* 1952, *page* 88)

Selecting thermal insulation for industrial requirements

Comments on those basic considerations which lead to a decision as to what insulation to use to meet stated requirements. Selection may be made from a wide variety of materials, so problem becomes one of proper evaluation of these materials. Author propounds two lists of questions, the answers to which will be helpful in reaching proper decision. 4 pages, 2 figures, 1 table. (*"Petroleum Refiner," January* 1952, *page* 87)



High-level reactor exchanger **built for one of the world's largest Ethanol plants, showing copper-lined channel and removable copper pass rib with unusual reinforcement designed to give support against high pressure drop at elevated temperatures.**



How A.O.Smith protected heat transfer equipment from the effects of Phosphoric Acid Corrosion and Hydrogen Diffusion

The problem was solved for Stone & Webster Engineering Corporation of Boston, engineers and designers of the Chemical Project of the British Petroleum Chemicals, Ltd., at Grangemouth, Scotland, with this deoxidized copper-lined, high-level reactor exchanger.

Our metallurgical laboratories ran tests on various materials in collaboration with Stone & Webster Engineering Corporation and Shell Development Company, the process licensor, which aided them in establishing deoxidized copper as the most suitable material for the protective lining.

Our welding laboratories then determined procedures to be used in the shop for welding copper to copper, copper to steel, and silver-soldering copper to steel.

Combining all laboratory assistance with the experience of the A.O. Smith heat transfer and mechanical design groups made production of this unit possible.

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An excellent example of completely automatic volume checkweighing. EXACT WEIGHT "Selectrol" handling Kremel puddings. Corn Products Co., Chicago, Ill.

Today's Handling and Packaging Problems . . . .

The planning stage is the place to cope with labor shortage and cost control this year. How? By skillful use of equipment to cut manpower . . . improve quality . . . cut processing and handling time. Face the fact of general labor shortage for 1952-53. Equipment must substitute and since good scales are a vital link in controlling quality, insuring uniformity and cutting costs incorporate them in your plans now. Strive for as many laborless applications as possible. You can do this with EXACT WEIGHT "Selectrol" (illustrated above), a fully automatic application for volume high-speed checkweighing. A wide range of EXACT WEIGHT models are available for semi-automatic packaging and handling. If manual operations are necessary use modern labor saving devises with these famous industrial weighing units. Remember wherever there's industry there's EXACT WEIGHT Scales. You will save time, money and product by including them in your plans. Write for details.

EXACT WEIGHT Sacking Scale Model No. 2224—Features pedestal mounting for more room for bag handling; revolving dial visible from any working angle; dust exclusion dashpot for trouble-free operation: new lock-jaw bagholder—capacity to 150 lbs.

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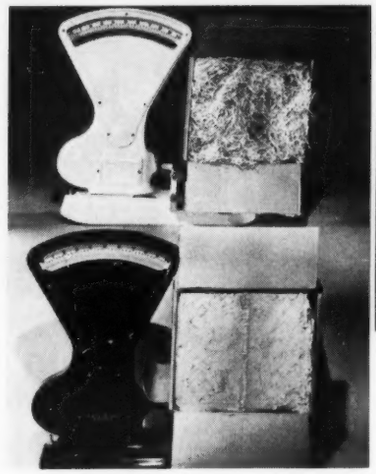
When inquiring check CP 2556 on handy form, pgs. 2-3

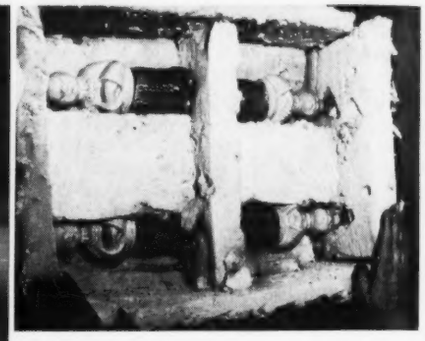
Packaging

Phenolic Foam Packing Material Reduces Shipping Costs

Low-cost, self-extinguishing product has about 1/7th the weight of top-grade shredded paper packing

Kraft paper, used in lining the mold, is stripped from the foam block





Glassware and ceramics are impressed to form cavities and thereby prevent shifting and breaking against each other

Weight comparison between top grade packing paper and phenolic foam

FIRST, large-scale commercial packaging use of Bakelite foamed phenolic resin by a mail-order house, recently, reduced shipping costs through savings in breakage and postage. Supplementary benefits were derived from reduced handling of claims and lower insurance costs.

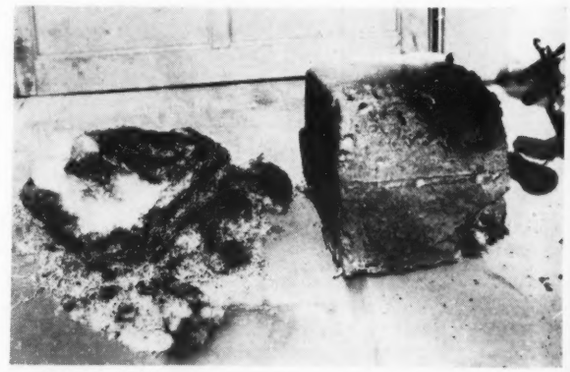
Successful adaptation and testing in actual use were carried out by Miles Kimball Co., Oshkosh, Wis., a specialty mail-order house. One year's operating experience with techniques developed by T. L. Drummond of the firm showed that, in addition to previously named advantages, product: reduces packing time, increases efficiency by lowering worker fatigue, and saves warehouse space used for storing packing materials.

About 1/7th the weight of top-grade shredded paper packing, this foam is the lightest dunnage material available in large quantities. Where weight makes a difference, as in parcel post or express shipments, a test reveals this favorable comparison for foamed resin: top-grade shredded paper packed in a corrugated container of about one cubic foot capacity weighed 5 lb 4 oz (top of photo 2, white scale) as compared to 1 lb 14 oz for phenolic foam in an identical box (bottom of photo 2, black scale). This is a saving of about 65% in shipping weight. Containers were shipped with packing but exclusive of merchandise.

Good resilience is another feature making this material suitable for packing, because it retains cushioning effects even under compression of several hundred pounds per square inch. Thermal insulating properties compare favorably with glass and rock wool, and it is thereby useful for packing perishables. In addition, it does not burn readily (see photo 4) — being classed as self-extinguishing.

A grain effect is produced during the manufacturing process, and heavy items are packed parallel to the grain for maximum compressive strength. When packing fragile glassware and ceramics, these items are pressed into end grain (see photo 3) of the foam to form cavities that prevent shifting and breaking against each other. Pre-cut slabs of foam in one to two inch thicknesses make it easy for packer to fill spaces by breaking off pieces to fit.

Foam making process involves mixing fluid Bakelite phenolic resin with an acid catalyst at room temperature, aerating with a mechanical stirrer, and pouring into a mold.



Foam only chars under blow torch flame and stops burning as soon as the flame is withdrawn

Continued expansion of the foam to about 200 times its original volume fills the mold in 15 to 30 seconds. After a very short holding time, the block of foam is discharged by opening the sides of the mold. Kraft paper, which lines the mold, is then stripped from the foam block (see photo 1). The resulting five-foot cubes are easily lifted by one man. Since the entire operation takes only 45 seconds from beginning to end, production rates up to 700 cubic feet per hour are possible using only two operators.

(Courtesy of Bakelite Co., a Division of Union Carbide and Carbon Corp., Dept. CP, 30 East 42nd St., New York 17, N. Y. . . . or for more information check CP 2557 on handy form, pages 2 and 3.)

Specially designed machines can close 3800 bags in 8 hours . . .

make plain-sewed or tape-bound closures on medium to large paper or textile bags

Uses: For closing paper or textile bags.

Features: High production, table-type machines with 6′ adjustable conveyors are specially designed for closing medium to large textile or paper bags. Can handle up to 3800 100-lb bags in 8-hr. day.

Description: Two styles (21800 R and 21800 P) have portable bases with mounting stands and bracket for the sewing head, power-driven conveyors, and adjustment features for raising or lowering the conveyor and sewing heads to meet requirements. They take bags made of cotton, burlap, osnaburg or jute; handle either single-ply or multi-

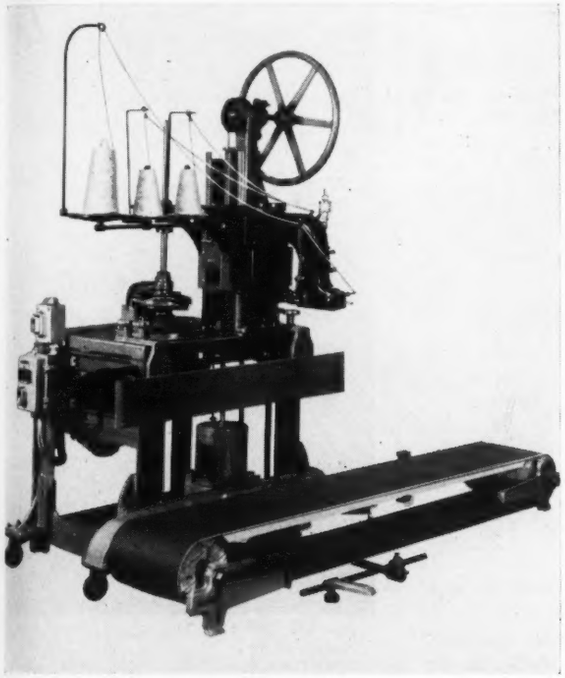


Table-type bag closing machine (21800 P) with conveyor

wall paper bags. Roller belt of conveyor is 12″ wide. Swinging head is adjustable and machines are equipped to handle nine different styles of sewing heads. Height 76″, width 80″, depth 54″.

(Both styles are products of Union Special Machine Co., Dept. CP, 400 N. Franklin St., Chicago 10, Ill. . . . or for more information check CP 2558 on handy form, pages 2 and 3.)

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Introducing a New, Rugged All-Crinkled Bag

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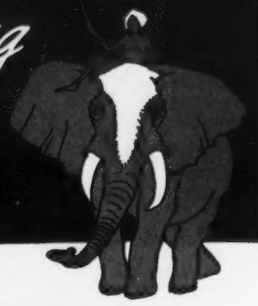

Here's a really tough multi-wall bag that will protect your product and save you money. Consider these TUFPAK features:

- **2 to 6 plies extra-strong crinkled kraft paper.**
- **Made to order in any combination of plain . . . wet-strength . . . wax-treated . . . waterproof . . . mesh-reinforced . . . or polyethylene coated plies. Polyethylene liner also available.**
- **The *only* all-crinkled bag supplied in 10″ to 44″ widths.**
- **Resilient and flexible—absorbs shock, rough handling.**
- **Creped surface takes slip and slide out of stacking.**

TUFPAK—the ideal shipping container for chemicals, foods; powdered, granulated, or crushed products.

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Product to be packed .....

Size of Bag ..... Wt. of Contents .....

Company .....

Address .....

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Individual ..... (Please Print)

NATCO

Reg. Pend.

When inquiring check CP 2560 on handy form, pgs. 2-3

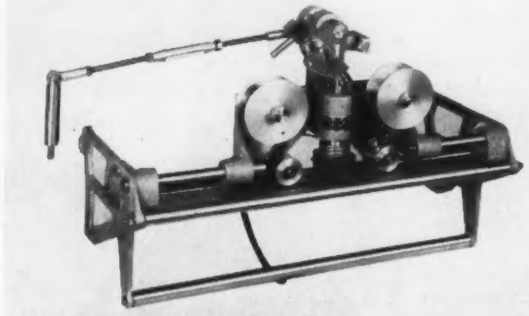
PACKAGING

Cellophane, glassine, foil, tissue are printed in all colors by automatic unit . . .

requiring no operator, unit is synchronized to speed of packaging machines

Uses: For imprinting products wrapped in materials which will accept hot roll-leaf imprinting, such as cellophane, glassine, foil, tissue, waxed paper, and similar materials.

Features: Gives clear, sharp and color-rich impressions as permanent as engravings. Unit requires no operator



Can be attached to packaging machine for imprinting wrappers

since it can be synchronized with packaging machine speed.

Description: Heat and pressure are combined to produce a permanent effect in user's choice from wide range of colors. Units are custom-built for both continuous and intermittent types of automatic wrapping machines. Gives approximately 20 to 40 square inches of imprints for 1c, manufacturer reports. In the imprinting operation, the roll leaf is fused into the surface of the material. Brass or steel type will last for thousands of impressions. Code changes can be made quickly for the wrappers.

(Product of The Industrial Marking Equipment Co., Inc., Dept. CP, 454 Baltic St., Brooklyn 17, N. Y. . . . or for more information check CP 2561 on handy form, pages 2 and 3.)

Polyethylene is preheated to provide high speed machine-sealing . . .

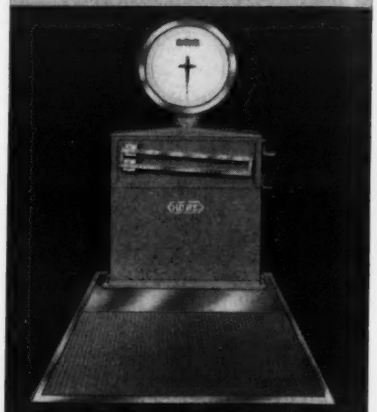
system maintains steady flow of sealed bags with minimum of handling

Uses: For conveying and sealing large, heavy packages in polyethylene.

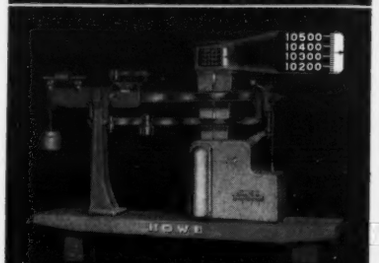
Features: Special 16″ closed top preheater conditions the polyethylene before the film enters the sealing mechanism, permitting very high sealing speeds. Machine is equipped with variable speed controls for operation at the most efficient bag-handling and sealing speeds. Sealing speed is variable from 150 to 550 lineal inches per min. Rapid height adjustment of the sealing mechanism makes machine ideal for successfully handling packages of different height.

Description: Dimensions of sealing machine are: 62″ high, 33″ wide, and 54″ long. Roller bed conveyor, equipped with adjustable legs, is supplied in 6 or 9″

HOWE Scales



Floor Scale with Cabinet Dial



Modernize your beam scales with Howe 77 Weightographs

HOWE

Two and Four Wheel

Hand Trucks

The **HOWE SCALE** *Co.*

RUTLAND, VERMONT

Dept. CP5 Rutland, Vermont

Please send me:

HOWE CONDENSED SCALE CATALOG NO. 11 ☐

HOWE 77 WEIGHTOGRAPH FOLDER ☐

HOWE HAND TRUCK CATALOG NO. 15-B ☐

Name _____

Title _____

Company _____

Address _____

City State

When inquiring check CP 2562 on handy form, pgs. 2-3

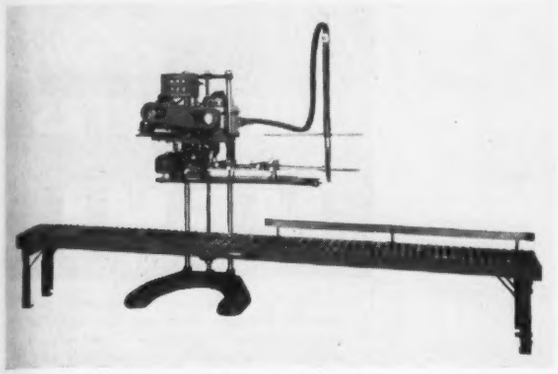


Photo shows rotary sealing machine with air extractor and roller bed conveyor

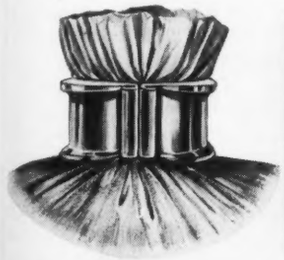
widths and any length required. Air extractor removes all air from bag and assures neat, compact package.

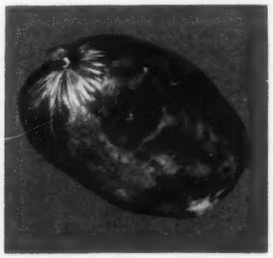
(Model D sealing machine is product of Amsco Packaging Machinery, Inc., Dept. CP, 31-31 48th Ave., Long Island City 1, N. Y. . . . or for more information check CP 2563 on handy form, pages 2 and 3.)

Seal polyethylene bags vacuum-tight with light aluminum band . . .

hermetical seal is applied manually with the aid of a simple portable machine

A positive mechanical, vacuum-tight seal for polyethylene bags has been developed which is made from a light aluminum band. It is applied with the aid of a simple, portable, and inexpensive machine shown in one of the accompanying photos. Originally developed for sealing bulky items, it is applicable to packages made from polyethylene bags.





Close-up of aluminum band seal on bag (upper left) is shown at the upper right. It is applied manually with the aid of machine shown at left

(Aluminum bands described are a product of Vac-Tie Fasteners, Inc., Dept. CP, 1140-1146 E. Jersey St., Elizabeth 4, N. J. . . . or for more information check CP 2564 on handy form, pages 2 and 3.)

SAVES TIME EFFORT ERRORS

LABELON PLASTIC *Write on it* TAPE

WON'T SMUDGE
★
STAYS CLEAN FOREVER
★
RESISTS: DIRT · OIL WATER · ACIDS

STICKS WITHOUT MOISTENING

PERFECT for LABORATORY, STOCK ROOM, OFFICE

Nothing else like LABELON—the amazing "Write on it" plastic tape! Use it to mark test tubes, glass vessels, test batches, specimens . . . to identify circuits, panel boards, fuel lines, instruments . . . to label stockroom shelves, bins, hard-to-mark objects. Ideal, too, for office files, folders, stored records, etc.

LABELON TAPE sticks without moistening to any smooth, clean surface — yet can be quickly removed. Resists heat up to 150°. Just write on it with pencil or stylus—message won't smudge. Choice of widths and colors. Handy dispenser with cutter bar.

See your nearest dealer, or write for sample and prices.

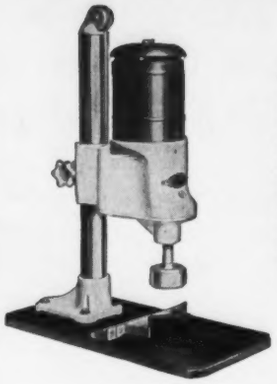
Write to Dept. CP

LABELON TAPE CO., Inc.
450 Atlantic Ave., Rochester 9, N.Y.

When inquiring check CP 2565 on handy form, pgs. 2-3

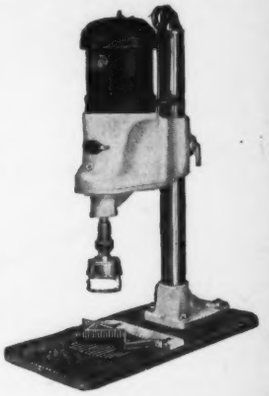
A new semi-Automatic capper for

FRICTION CAPS



The new Swanson Model 50-D semi-automatic capper properly sets all types of friction cap closures on glass, metal or fibre containers. Sturdy cam gear mechanism gives ample power for ANY friction cap setting—delivering fifty two-inch strokes per minute for speedy, low cost performance without operator fatigue. Uniform safe pressure is distributed to entire friction cap surface. Portable or permanently mounted on conveyor table, it is adjustable to any container height and pressure, made for long continuous, trouble-free service.

FOR SCREW CAPS



The improved Model 49-C semi-automatic capper for screw caps. No pedals to push, no lever to pull, no hand piece to hold, caps 50 jars a minute, eliminates breakage, no damage to cap finish, portable or permanent mount. Handles any caps up to 132MM in size, metal, plastic, or composition.

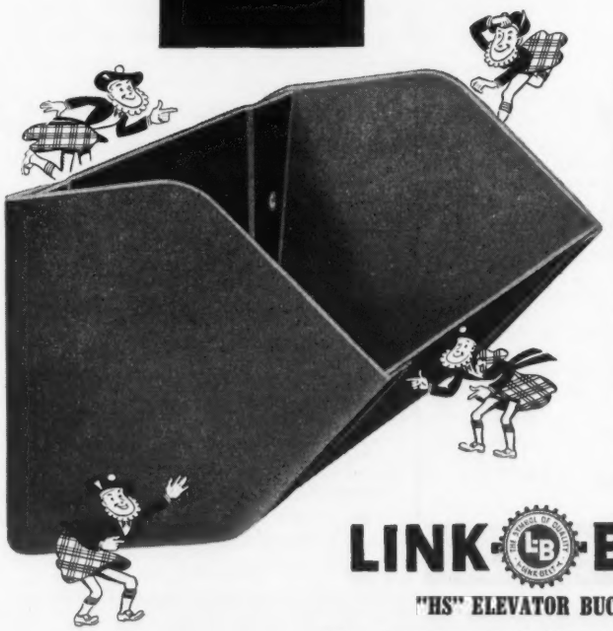
Both cappers fully tested in actual production line operation. Send for full particulars and prices.

W. H. SWANSON and COMPANY
P.O. Box 294 **Wilmette, Illinois**

When inquiring check CP 2566 on handy form, pgs. 2-3

get "HS" buckets for longer life

at no extra cost



The next time you buy buckets, be sure you get this advanced design by LINK-BELT

LINK-BELT "HS" Buckets give you the ultimate in centrifugal discharge bucket elevator operation . . . at either high speeds or nominal speeds. High bucket ends minimize spillage. Low front lip provides efficient pick-up.

And "HS" Buckets last longer: Bucket ends, same gauge as body, are folded over body for added strength and rigidity. Back of bucket is crimped for end fold, giving smooth, flat back surface contact. Smooth interior permits quick, clean pick-up and discharge.

The complete Link-Belt line also includes steel, malleable and Promal buckets of various designs, including Salem and continuous types.

12,386-

LINK-BELT

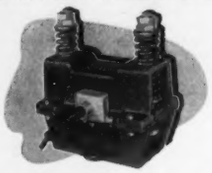
"HS" ELEVATOR BUCKETS

LINK-BELT COMPANY: Chicago 9, Indianapolis 6 Philadelphia 40, Atlanta, Houston 1, Minneapolis 5 San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8 Springs (South Africa), Sydney (Australia). Offices, fa tory branch stores and distributors in principal cities.

When inquiring check CP 2567 on handy form, pgs. 2-3

The *Right* Formula For a 'Positive Reaction' in the Handling of Bulk Chemicals

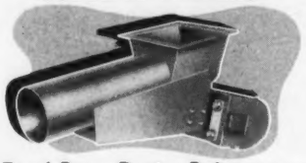
ELECTRIC VIBRATORS



Make Stubborn Materials Flow Freely

+

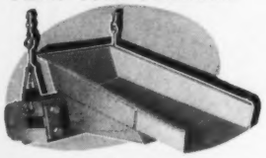
TUBULAR FEEDERS



Feed Pure, Dusty, Poisonous Materials Safely

+

FLAT PAN FEEDERS



Up To Hundreds of Tons Per Hour—Variable Control

+

VIBRATING SCREENS

Wet or Dry—Single or Multiple Decks

+

HOPPER LEVEL SWITCHES

Maintain Desired Amount of Material In Bins, Hoppers

= Fast, Economical Handling of Most All Chemical Products... Extremely Hot, Poisonous, Fine, Abrasive, Lumpy, Dry, Damp, Pure.

SYNTRON

Material Handling Equipment

Syntron Vibratory Equipment assures 'positive' handling of bulk chemicals — easily and efficiently. It is adaptable to the many material handling applications found in chemical processing.

Electric Vibrators open up clogged bins, hoppers and chutes — make them free-flowing.

Vibratory Feeders, equipped with a variety of troughs for different chemicals, feed from pounds to hundreds of tons per hour.

Vibrating Screens remove foreign objects and lumps from powdered chemicals — sizing chemicals in granule form.

Hopper Level Switches keep a constant level in hoppers handling dry chemicals not exceeding nut-size.

Syntron Vibratory Equipment handles these many different operations easily and efficiently. No motors, bearings, gears, idlers, etc. to wear and require oiling. Simple electromagnetic vibration does the job.

Available in different sizes and styles, from small to large models.

For Full Details Write For Catalog No. 519

SYNTRON COMPANY

310 Lexington Avenue Homer City, Penna.

When inquiring check CP 2568 on handy form, pgs. 2-3

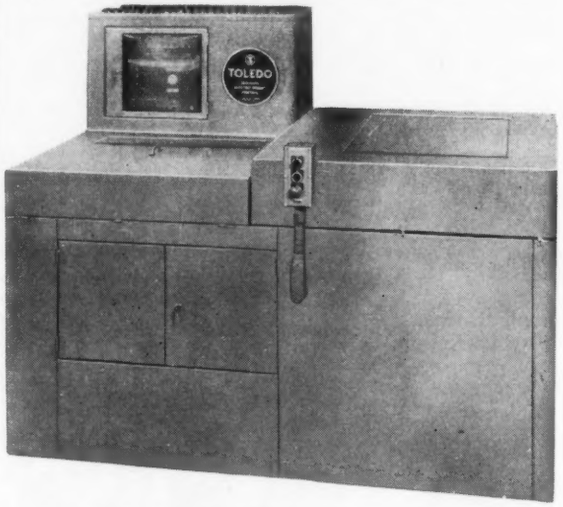
Classifies, weighs, and zones containers accurately at high speed . . .

automatic scale uses electronics principles for speedy, sensitive check-weighing of products

Uses: For classifying, zoning, weighing packages.

Features: Using photo-electric cell, device handles packages at conveyor-line speed. Designed to handle weights in the 4 oz to 10 lb range, scale will weigh, classify, and zone containers into as many as eight different weight zones. Accuracy is to 2/10 of 1%. Articles are classified at rate of 60 to 100 per min, depending on size.

Description: Articles to be weighed and classified are moved by automatic conveyor onto scale. Indexing device allows only one article at a time to weighing belt. As article moves along weigh belt, its weight causes an interceptor, with a bar and slot arrangement, to pass in front



Weighs, classifies, zones packages at conveyor-line speed

of a photo-electric cell. Bars and slots passing in front of photo-electric cell vary with weight of article. Photo-cell transmits number of bars passed to an electric counter which then activates a solenoid. Solenoid opens gate in distributing section corresponding to weight of article. During this time container is moving off the weigh belt to the distributing section where it moves through the gate which has been opened to receive it.

(Product of Toledo Scale Company, Dept. CP, Toledo 1, Ohio . . . or for more information check CP 2569 on handy form, pages 2 and 3.)

Releases pictorial review of packaging machines

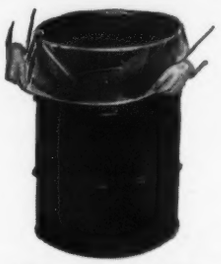
Automatic cartoning and wrapping machines are featured in 32-page catalog. Pictures of 35 machines are offered as well as illustrations of special packaging attachments. Catalog shows full line of machines to meet requirements for packaging "everything from penpoints to peroxide." Information is provided on the various models, their production speeds, and special attachments. In addition to machines, illustrations show wide range of packages produced.

"Automatic Machines for Cartoning, Wrapping, Special Packaging" is issued by F. B. Redington Co., Dept. CP, 112-J S. Sangamon St., Chicago 7, Ill. When inquiring specify CP 2570 on handy form, pages 2 and 3.

Polyethylene Plastic

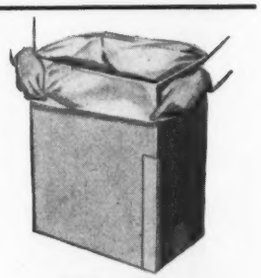
DRUM LINERS by MEHL

Spectacular economies are effected through these new methods of shipping bulk chemicals. Minimum waste . . . eliminate re-cleaning cost . . . provide top protection for your valuable products.



STEEL DRUM LINER

FIBRE DRUM LINER



BOX LINER

Write, wire or phone us concerning your particular problems.

MEHL MFG. CO.

A DIVISION OF MEHL BAGS

Phone: CHerry 8430 • 2059 READING ROAD

CINCINNATI 2, OHIO

When inquiring check CP 2571 on handy form, pgs. 2-3

Offer adhesives for high-speed sealing of cartons . . .

clean running, fast setting, hard sticking

Uses: Liquid glue especially developed for high-speed, top and bottom carton sealing.

Features: Maker reports that it is a very clean running, fast setting, and hard sticking glue. Usually no more than one machine clean-up per day is required.

Description: Cart-N-Seel glue is offered in two grades: 233H which is ready for use, and 233HH which is concentrated and requires dilution with 10-15% water to get it down to the consistency of the former.

Neither is compatible with resins, therefore machines must be cleaned out before using. Both grades are suitable for use with "difficult to adhere" boards.

(Product of Stein, Hall & Company, Inc., Dept. CP, 285 Madison Avenue, New York, N. Y. . . . or for more information check CP 2572 on handy form, pages 2 and 3.)

Chart shows 14 colors for industrial tapes

Fourteen color varieties of industrial tapes are shown in this four-page color chart.

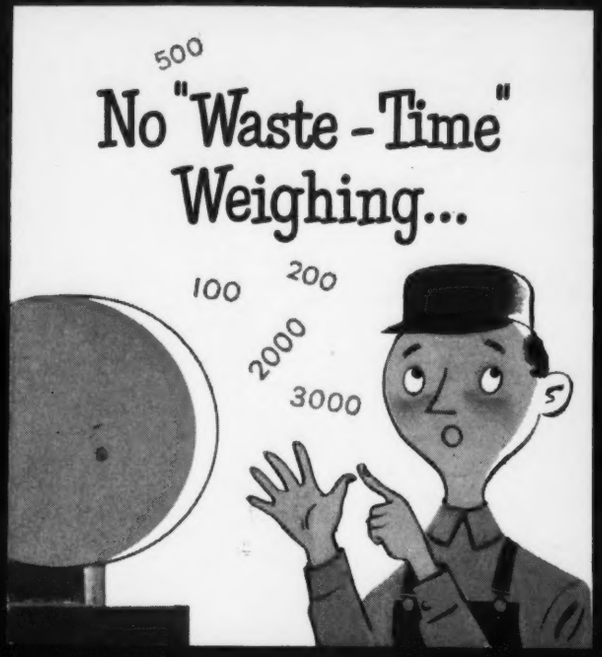
Descriptions are given for eight different tapes, ranging from plastic film tape for sealing bottles of chemicals and drugs, to filament-reinforced tape for heavy-duty palletizing and bundling of cartons and metal objects.

Descriptions for other tapes shown include cellophane tape and two moisture-resistant acetate fiber tapes for use by printer-converters in making printed packaging tapes; and a film laminate tape for identifying and labeling tires or other rubber goods.

In addition, a third acetate fiber tape for edging documents and permanent splicing of paper, and an acetate film tape for special film-splicing and reinforcing are shown.

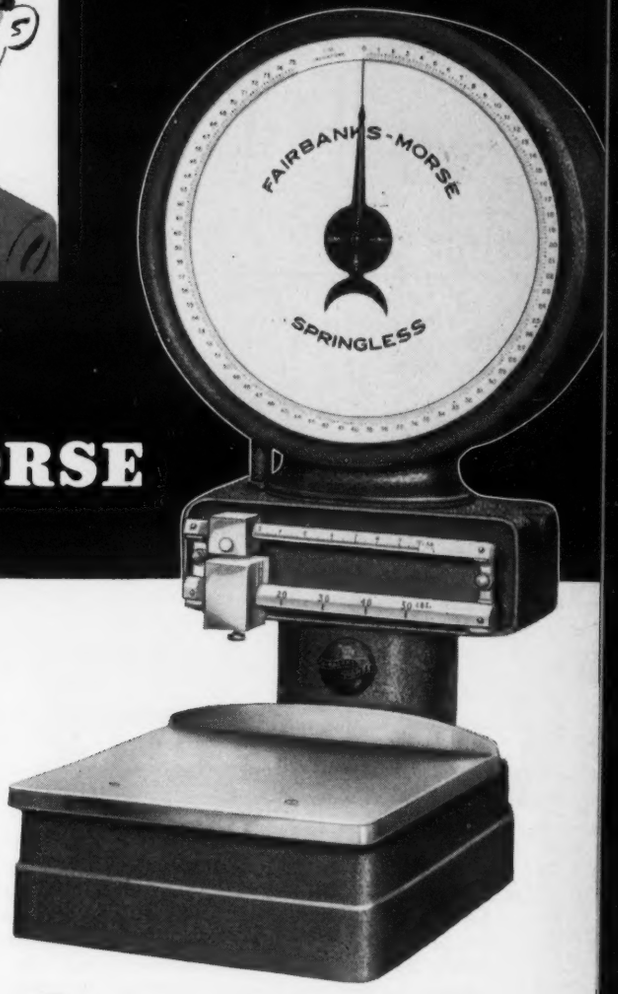
1952 Colored Industrial Tape chart is issued by the Minnesota Mining & Mfg. Co., Dept. CP, 900 Fauquier St., St. Paul 6, Minn. When inquiring specify CP 2573 on handy form, pages 2 and 3.

For more information on product advertised at right, specify CP 2574 . . . see information request blank between pages 2-3.



WITH

FAIRBANKS-MORSE



You speed your weighing operations with Fairbanks-Morse Bench Dial Scales. And that means there are no "bottlenecks" to hold up production all through your plant. Here's why:

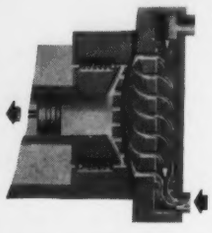
With Fairbanks-Morse Bench Dial Scales, weights are read right at the point of the indicator. No time-wasting mental calculations are needed. You can weigh as fast as material can be moved on and off the scale platform. And, easy-to-read charts plus elimination of mental calculations reduce the possibility of human error . . . stop profit-eating weighing losses.

To eliminate "waste time" weighing in your operations, consult your Fairbanks-Morse weighing expert. Or, if you prefer, write Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago 5, Ill.

FAIRBANKS-MORSE,

a name worth rememberin

SCALES • DIESEL LOCOMOTIVES AND ENGINES • ELECTRICAL MACHINERY • P
HOME WATER SERVICE EQUIPMENT • RAIL CARS • FARM MACHINERY • MAGN



INTAKE STROKE

DISCHARGE STROKE

No Contamination

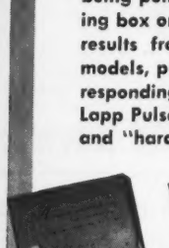
. . . and Positive control of pumping volume

Lapp

Auto-Pneumatic

PULSAFEEDER

Reciprocating piston action provides positive displacement. But piston pumps only a hydraulic medium. Diaphragm does no mechanical work—acts only as floating, balanced partition, isolates chemical being pumped from working pump parts—eliminates need for stuffing box or running seal. Pumping speed constant—volume variation results from variation in piston-stroke length. In Auto-Pneumatic models, pumping rate precisely controlled by instrument air pressure responding to any instrument-measurable processing variable. The Lapp Pulsafeeder is successfully handling almost all highly corrosive and "hard-to-handle" chemicals, against pressures up to 2,000 lbs.



WRITE FOR NEW BULLETIN

No. 300, just issued. 24 pages of description, specifications, typical applications, flow charts. Inquiry Data Sheet included from which we can make specific engineering recommendation for your processing requirement. Write Lapp Insulator Co., Inc., Process Equipment Division, 559 Maple Street, Le Roy, N. Y.

When inquiring check CP 2575 on handy form. pgs. 2-3

PACKAGING

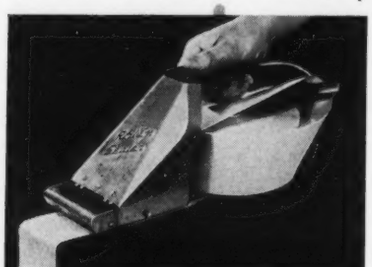
Cartons are sealed quickly by portable dispenser for gummed tape . . .

sealer also works in upside-down position

Uses: For sealing or re-sealing cartons for shipping purposes.

Features: Portable gummed tape machine works in any position, including upside-down or sideways. Cuts tape waste to minimum.

Description: In one unit, gummed tape dispenser, equipped with non-spilling water tank, is operated with one hand. The machine rolls freshly



moistened tape directly onto the carton. A twist of the wrist cuts the tape to exactly the right length after the application. Tape can be dispensed to any length, up to an entire 600′ roll of sealing tape or reinforced filament tape, and in any width up to three inches.

No lubrication is necessary. Has only a few, quickly replaceable moving parts. Maintenance is limited to filling the water tank, rinsing of the moistening sponge, and replacement of worn cutter blades.

(Product of the Mid-States Gummed Paper Co., Dept. CP, 2515 S. Damen Ave., Chicago, Ill. . . . or for more information check CP 2576 on handy form, pages 2 & 3.)

Tapes and dispensers for box sealing

Four-page folder shows uses of pressure-sensitive tapes in various box sealing tasks. Sixteen pictures present actual applications of tapes on textile goods, wooden boxes, cardboard boxes, and others.

Use of this tape on manual, semi-automatic, and fully automatic dispensing equipment is also shown.

Six types of tape described in two-color folder are constructed with tape backing of cellophane, paper, acetate fiber, and acetate film. Tapes are offered in colored and transparent material. Properties of six tapes are tabulated according to thickness, ad-

SPO AIR VIBRATORS

Specify SPO dependable, low-cost air vibrators for all materials handling and foundry applications.

SPO vibrators feature full power starting, hammer-like blows, high-speed operation, long trouble-free service life.

Blow for blow, you can't beat SPO air vibrators! For information on complete line, write today for Bulletin 50.

529-SI

SPO INCORPORATED

6531 Grand Division Ave. • Cleveland 25, Ohio

When inquiring check CP 2577 on handy form, pgs. 2-3

THE COMPLETELY NEW LEWIS-SHEPARD JACKSTACKER® TRUCK

NOW you can move and stack in places you never dreamed possible!

Most compact truck of its kind, 26½" long. Right angle stacks in 5' 6" aisles. New, compound wound, traction motor packs twice the power in 48% less space . . . Multiplies your manpower and space in receiving, production, storage, and shipping.

The Quality Truck in the Walkie Field—89 engineering advancements. Four types. Capacity to 6,000 pounds.

Check with L-S First. Write for Complete Information

Since 1915

The "MASTER" Line

LEWIS-SHEPARD PRODUCTS, Inc.

Dept. L-30, Watertown 72, Mass.

Midwest Plant: Crawfordsville, Ind.

Sales-Service in Principal Cities—See Your Yellow Phone Book

LEWIS-SHEPARD Products, Inc.
Dept. L-30, Watertown 72, Mass.
I want to hear more about the new JACKSTACKER
Name_____
Company_____
Street_____
City_____ State_____

When inquiring check CP 2578 on handy form, pgs. 2-3

hesion, tensile strength, and elongation or stretch.

Folder PC-FDTM1 (321) J. is issued by Minnesota Mining and Manufacturing Co., Dept. CP, 900 Fauquier St., St. Paul 6, Minn. When inquiring specify CP 2579 on handy form, pages 2 and 3.

Polyethylene replaces rubber in wipe-off action . . .

plastic material resists erosion more than rubber

Chemically inert properties of polyethylene have been utilized in packaging line of Pond's Extract Co., Clinton, Conn. Wiper blades of polyethylene are used to smooth face cream after it had been put in jars on line. Plastic material replaced rubber wiper blades because polyethylene proved to be more erosion-resistant.

Polyethylene furnishes required flexibility as well as low rate of water absorption. Other advantages of polyethylene are that it is unaffected by alcohols, perfume oils, and hydrocarbons.

(Polyethylene sheet is product of Plax Corp., Dept. CP, Box 1019, Hartford, Conn. . . . or for more information check CP 2580 on handy form, pages 2 and 3.)

Shows parade of tapes, labels, and markers

Fifty-page catalog reviews line of self-sticking industrial products. Subjects covered in six sectional handbook are wire and pipe markers, safety signs, reflective signs, masks, stencils, and printed roll tapes. Self-sticking products are freely illustrated in four-color catalog. Descriptive material covers composition, specifications, and job applications. Colorful variety of wire markers include heat-resistant types for marking electrical circuits.

Display of masks ranges from drafting tape used on dispenser cards to plastic electrical or fiberglass for special applications. Roll tape section concludes catalog with color chart and dimensions of cellophane and acetate fibre tapes. Cat "Self-Sticking Industrial Products" is issued by W. H. Brady Company, Dept. CP, 16 E. Spring St., Chippewa Falls, Wis. When inquiring specify CP 2581 on handy form, pages 2 and 3.

For more information on product at right, specify CP 2582 . . . see information request blank between pages 2 and 3.

NEW WAY TO CHECK PACKAGE EFFICIENCY

IF YOUR BUSINESS IS DRY CHEMICALS, THESE PRACTICAL NEW CHECKLISTS CAN HELP YOU DO A BETTER PACKAGING JOB

WITH UNION'S new *Chemical Package Evaluator*, you can take a rough but usually accurate measure of your container's efficiency.

THIS HANDY "packaging scorecard" may help you crystalize weaknesses which are adding unnecessary expense to your production and distribution costs.

IT WILL enable you to chart possible areas of improvement.

IT CAN make it easier for you to determine which are worth pursuing, and in what order.

NO CHARGE for your copy. The coupon will bring it quickly.

CHEM-PAK®
SIFT-PROOF PAPER BAGS FOR CHEMICAL PRODUCTS

UNION BAG & PAPER CORPORATION

New York: Woolworth Building
Chicago: Daily News Building

Union's modernized plant at Hudson Falls, N. Y. Billion-bag specialty packaging headquarters

CHEM-PAK

FOR LOW-COST PACKAGING OF DRY CHEMICALS IN UNITS UP TO 25 LBS.

Where a more economical package is indicated, one answer may be CHEM-PAK, *Union's hard-wearing, sift-proof paper bag* • CHEM-PAK *bags are made to your specification, in many paper combinations and with various closures. Their protective qualities are noteworthy, even in comparison with more expensive containers* • *They are versatile, easy to handle, inexpensive to pack and ship, colorfully suited to retail display.*

NEW! Mail this coupon for practical CHEMICAL PACKAGE EVALUATOR. No charge or obligation.

Union Bag & Paper Corporation
Woolworth Building, New York 7

Please send me the new Chemical Package Evaluator.

Name_____ Title_____

Company_____

Address_____

City_____ Zone_____ State_____

Products_____

CP 559

When inquiring check CP 2583 on handy form, pgs. 2-3

Expanding Chemical Production

Refinery expansion in Kentucky nears completion

Extensive new facilities for Ashland Oil and Refining Co. at Catlettsburg, Ky., are expected to be completed before the third quarter of this year. Principal work involves a 11,000 bpd vacuum unit to produce gas oil for catalytic cracking feed from reduced crude. A new synthetic crude tower will permit an increase in catalytic cracking capacity from 22,000 to 27,000 bpd. Work was recently completed in this refinery on a 10,000 bpd kerosene doctor treating unit.

In addition, the company is revamping its equipment at its Tonawanda, N.Y., plant to meet new process requirements, including a cracking unit and kerosene treating. This work is scheduled for completion around the end of 1952.

Anhydrous ammonia production begun at Mathieson plant.

Production of anhydrous ammonia at the $75-million Morgantown plant of Mathieson Chemical Corporation has begun. The company was awarded a 5-yr lease by the Army for operation of the plant, with an option for 15 more years.

The Morgantown plant is one of the largest ammonia plants in the country and has a capacity for producing more than 200,000 tons of ammonia and/or methanol annually, as well as formaldehyde.

Boost capacity of chlorine output 10% at Diamond Alkali

Expansion plans which will increase chlorine-producing capacity by ten per cent at the Diamond Alkali Company plant at Houston, Texas, have been announced. This additional capacity, needed for the manufacture of perchlorethylene, originally was part of the expansion program at the company's Painesville, Ohio, plant.

Meanwhile, construction on the $12 million expansion project at Painesville has been temporarily halted in view of the Houston move. The Painesville expansion, begun last year, will require two years for completion and is designed to increase the production of chlorine and caustic soda by the electrolytic method.

Plans approved for $1.8 million nitric acid expansion

Plans have been completed and approved by the Spencer Chemical Company, Kansas City, Mo., for installation of two additional nitric acid units at the Jayhawk Works and for two auxiliary storage spheres at the Henderson Works at a total cost of approximately $1,850,000. This arrangement will permit the company to substantially increase its production of fertilizer grade ammonium nitrate. The new installations are expected to be completed and in operation by June, 1953.

Styrene copolymer output increased; paint latex ready soon

Facilities are now in operation at the Dewey & Almy plant at Acton, Mass., for producing high stryrene copolymer latices in volume, and a paint latex of superior water and scrub resistance is in the final development stage, the company has announced.

The company was among the first to produce synthetic latices, including those of the styrene copolymer type; its first plant for synthetic copolymers was in operation in 1943. In addition to styrene copolymers, the company also distributes polyvinyl acetate emulsions to the paint industry.

Take initial steps for added production of chlorine

A contract to engineer and build facilities to convert by-product hydrochloric acid to chlorine at the Hercules Powder Company's toxaphene plant in Brunswick, Ga., has been awarded. Construction of the plant, scheduled to begin this summer, is expected to be completed by the end of the year.

The unit will consist of a large compressor house, a reactor enclosure, and substantial yard equipment, including drying equipment, condensers, pumps, and other auxiliaries. Reclaimed gases produced here will be recycled in the process plant for production of toxaphene, an important agricultural insecticide used in control of cotton and livestock insect pests.

Because the gases handled are corrosive, the compressor house will have wooden trusses, concrete block walls, reinforced concrete floor, and a roof of plastic-type translucent material. In addition, incoming air will be washed by Venturi scrubbers, and the building will be kept under positive pressure. The reactor enclosure will be of structural steel and corrugated asbestos siding.

Get green light on polystyrene plant construction

A new plant, capable of monthly output of 1,200,000 lb of dye color powder and standard extruded pellets of polystyrene, will be built at Calumet City, Ill., for Catalin Corp. of America.

Complete new Ethyl-producing plant, on 400 acres near Houston

Completion of a new plant for the manufacture of "Ethyl" anti-knock compound has been announced by the Ethyl Corporation. The Houston plant represents an increase of approximately one-third in the company's tetraethyl lead capacity. Corresponding increases in Ethyl's capacity for sodium, chlorine, hydrogen chloride, ethyl chloride, and other chemical intermediates will also be obtained.

The new plant is located along the south bank of the Houston Ship Channel, about 17 miles from downtown

Houston, and the entire plant area embraces approximately 400 acres. The present buildings cover about 80 acres, leaving substantial room for future growth. The plant will provide its own requirements of the chemical intermediates needed in tetraethyl lead manufacture.

Chlorophyll company combines with chemical, pharmaceutical firm

Consummation of plans to merge American Chlorophyll, Inc., Lake Worth, Fla., with Strong, Cobb & Co., Inc., Cleveland, Ohio, chemical and pharmaceutical manufacturers, have been announced.

The merger is expected to facilitate development of chlorophyll by adding research facilities and manufacturing techniques of Strong, Cobb to the chlorophyll concern. Several new sources of chlorophyll are under investigation at the Lake Worth plant where additional equipment and improved extraction methods are expected to double the company's output.

Will supply vinyl chloride resins to rubber, plastics firm

An arrangement for the supply of Ultron vinyl chloride resins from Monsanto Canada Ltd. has been concluded by Barringham Rubber and Plastics Co., Ltd., of Oakville, Ont. In addition to supplying the resins for Ultron plastics, Monsanto will provide technical assistance for the development of new products in the vinyl field.

New glycol plant begins increased production in August

An additional plant at Williamsport, Pa., will aid increased demands for production facilities of the Glyco Products Co., Inc., Natrium, W. Va. Manufacturing of some products will begin in early August with full production expected later in the year.

The plant has about 150,000 sq ft of floor space with about 30 acres of land for expansion. Its power plant has 3 boilers totaling 1400 hp; a 500-kw geared turbine and generator. Processing water at 500 gpm is furnished by wells. Refrigeration includes a 41-ton ammonia unit.

New oxo alcohol plant scheduled for Standard Oil (Ind.)

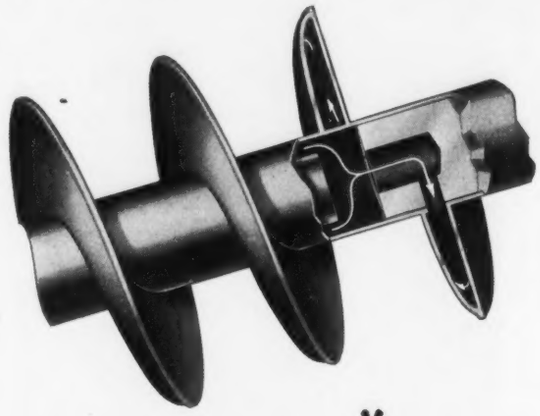
Standard Oil Company (Indiana) has named the M. W. Kellogg Co., refinery and chemical plant engineer-contractors, to construct a large iso-octyl alcohol plant at Standard's Wood River, Ill., refinery.

The new plant is expected to produce about 10 million pounds of iso-octyl alcohol each year for the manufacture of plasticizers. The plant includes a fractionation system for obtaining heptene as a "heart cut" from an olefin feed stock, a refinery gas reformer for preparation of hydrogen and carbon monoxide, and the actual iso-octyl section.

American process development plant takes strides in Cuba

Engineering contract has been awarded by the Nickel Processing Company for construction of a pilot plant at the US government-owned Nicaro Nickel Plant which the company operates under a management contract. The project is part of that company's program for expansion of production.

A great new advancement in heat exchangers...

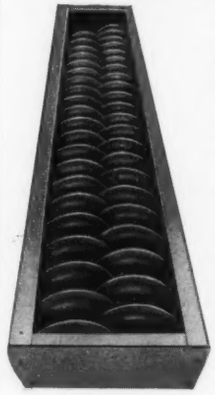


THE **holo-flite*** PROCESSOR
(HOLLOW-FLITE)

A simpler, more compact way to cool slurries, solids or pastes—in continuous flow!

Do you have processes where slurries, solids, pulps or pastes must be cooled or cooked? Do you know you can now handle such processes—*in continuous flow*—in as little as 1/5th the space required by other types of heat exchangers—and with many other important advantages?

The newly-developed HOLO-FLITE Processor is the answer!

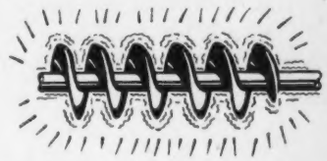


what IT IS!

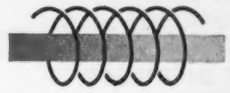
Basically the HOLO-FLITE consists of two or more flights of hollow-bladed screw conveyors. The product to be processed moves in a trough around the conveyor screws. The heat-transfer fluid circulates through the hollow blades and shafts of the conveyor. The product is constantly rotated into, around, under and over the blades and shafts through which the heat-transfer fluid is circulating, assuring quick, uniform heat passage between the two mediums—*as the product is continuously moved along in a bulk-flow without interruptions!*

why IT'S BETTER!

The HOLO-FLITE principle provides many important advantages in modern processing operations...



ITS LARGE HEAT-TRANSFER SURFACE requires far less space—as little as 1/5th the space required by other heat-exchange equipment. Further, flights can be "stacked" as high as desired to save floor space, simplify installation!

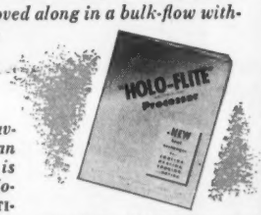


ITS SLOW ROTATION IS SO GENTLE that granular and powdered solids are handled with no dusting—little or no particle abrasion. Result—no dust recovery problems... simple, inexpensive installation.

IT IS ADAPTABLE to a wide range of applications—handles solids, pulps, pastes and slurries with equal ease. Heat transfer agent can be refrigerant, water or other fluids to provide a wide range of temperatures. Cooled products can be packed directly from HOLO-FLITE discharge, saving time, space and additional handling.

IT CAN BE DESIGNED to handle virtually any capacity by varying the diameter and length of the flights, and the number of "tiers."

Get the complete story on HOLO-FLITE *savings and how this new advancement can simplify your processing operations. It is backed by the same organization that pioneered* COTTRELL *Precipitators and* MULTICLONE *Collectors—your assurance of complete dependability.*



DETAILED INFORMATION!
New 8 page bulletin describing HOLO-FLITE features and applications will gladly be sent on request. Write, wire or phone for your free copy!

*Reg. T.M.

WESTERN Precipitation CORPORATION

ENGINEERS, DESIGNERS & MANUFACTURERS OF EQUIPMENT FOR COLLECTION OF SUSPENDED MATERIALS FROM GASES & LIQUIDS

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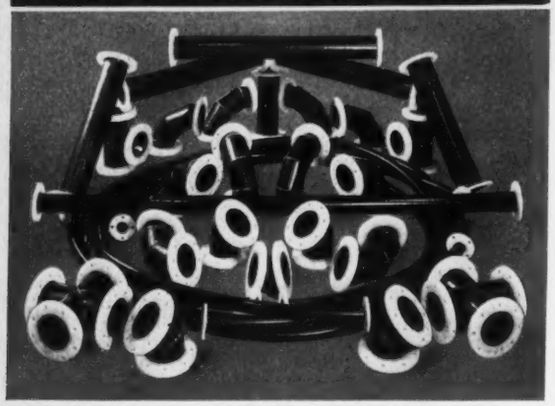
PRECIPITATION CO. OF CANADA, LTD., DOMINION SQ. BLDG., MONTREAL

When inquiring check CP 2584 on handy form, pgs. 2-3

CYCLOTHENE
Industrial Chemical
Semi-Flexible PLASTIC PIPE



FOR HANDLING ACIDS AND ALKALIES — PHARMACEUTICALS — CORROSIVES — FOODS — BEVERAGES — FUMES — WASTE DISPOSAL

CYCLOTHENE is a tough, durable plastic pipe of excellent impact strength at both high and low temperatures. It is highly resistant to a wide variety of solvents and is unaffected by mineral acids, salts and alkalies at temperatures to 150°F. It retains its flexibility and other desirable properties at 40° below zero. Repeated freezing and thawing have no affect on it. It is completely free from electrolytic corrosion.

LOOK AT THESE ADVANTAGES —

CHEMICALLY RESISTANT Because CYCLOTHENE is a high-molecular weight, fully saturated polymer containing no extractable plasticizers it is completely resistant to oxidation and is well suited for conveying severely corrosive concentrations of most reagents without degradation of its advantageous physical characteristics. In addition to its chemical handling ability, its high purity and inertness make CYCLOTHENE entirely satisfactory for conveying even the most sensitive pharmaceuticals, foods, syrups and potable beverages.

LIGHT WEIGHT CYCLOTHENE PIPE is furnished in easy to handle, lightweight coils. Any standard pipe size from ½" to 6" is available from stock. 4" and 6" sizes are furnished in 25 ft. lengths; smaller sizes in continuous coils to 400 ft. For example, a standard coil of 2" pipe is 250 ft. long but weighs only 110 pounds.

SPEEDY INSTALLATION Semi-flexible CYCLOTHENE PIPE follows surface contours and can be bent. Long coils minimize connections. When necessary, connections are readily made with insert couplings furnished either with or without standard pipe thread adapters. Where desired, pipe can be furnished to specified lengths with integrally welded flanges. Complex piping installations are completed with fabricated ells, tees, Y's, etc.

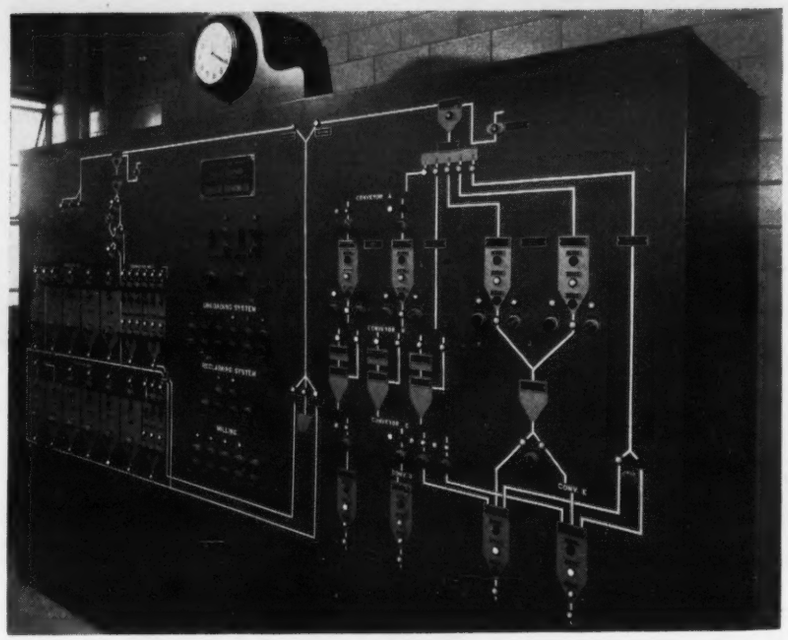
LOW COST CYCLOTHENE PIPE can replace expensive metal alloy pipe, bulky ceramic pipe and many other types of costly conductors. Installation costs are much lower. Service life is much longer. Taken altogether the savings with CYCLOTHENE are really exceptional.

Write for complete information and specifications.

More Protection Insured

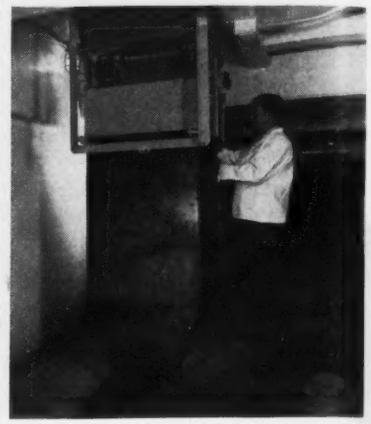
MUNRAY PRODUCTS, Inc.
Sales Division of The POLY-CYCLO PRODUCTS Co.
12400 CROSSBURN AVE. • CLEVELAND 11, OHIO

When inquiring check CP 2585 on handy form, pgs. 2-3



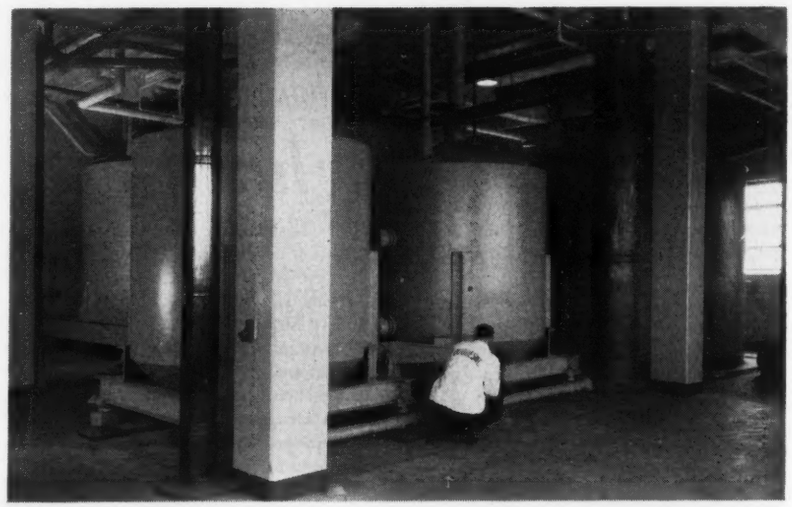
Construction & Maintenance

Control panel for push button control of processing operations located on 5th floor of brew house



Connection for collection of broken kernels and chaff from malt cleaners

Tons of Profitable Cattle Feed Recovered Daily in Brewery



Additionally, dust collectors effect safety function, promote plant maintenance, and reduce air pollution

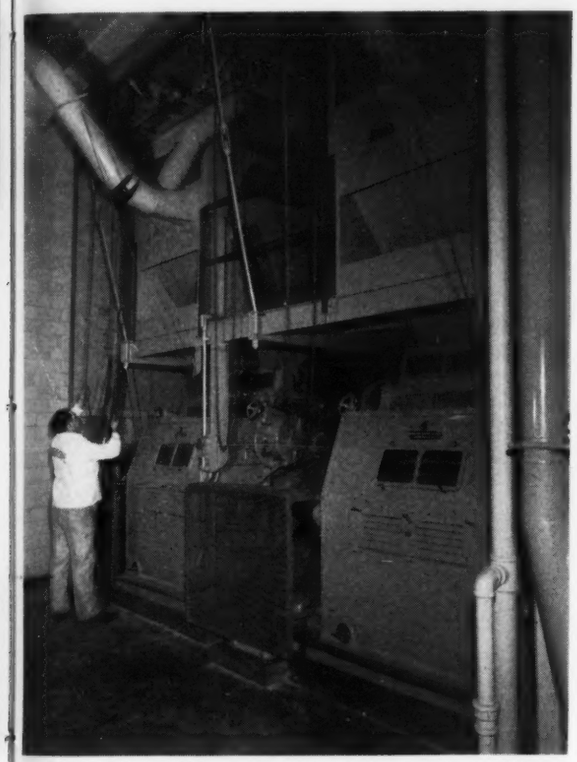
Dust collection at scale hoppers where brewing materials are weighed before milling

IN its new brew-house building which is one of the most modern and best equipped of its kind, the Duquesne Brewing Co. has installed a complete dust control system. Located in Pittsburgh, the concern is the largest brewery in Pennsylvania — with a capacity of 2,000,000 barrels of Duquesne Pilsener and Silver Top brands per year.

Operating at almost capacity, Duquesne is recovering, by means of the dust collectors and driers, about 25 tons of cattle feed per day. This material is a profitable by-product of the brewing business, and huge quantities would be lost as dust without an effective system of recovery.

There exists a number of sources throughout the plant which serve as focal points for dust collection (see accompanying photos 2, 3 and 4). These sites may be classified under two major headings: 1) collection of dust from grain ingredients before manufacturing into beer, and 2) collection of dust from "dried spent grain" after the beer-making process.

The first classification includes collection from a suction system which unloads grain by drawing it from freight cars to top of the 11-story brew house. About 500 pounds of dust are salvaged from each car unloaded. Other equipment belonging to the first category are: malt cleaners in which loose husks, straws and other foreign matter are removed from the barley malt before it is loaded into storage tanks below; screw conveyors which route grain from the cleaners to the storage tanks; storage tanks themselves; and scale hoppers for weighing raw material. Also polishers (for further cleaning), malt and cereal mills, cereal hoppers, ground malt hoppers, and weighing stations for these ingredients.



Dust collection from grain cleaners above the malt mills (vertical pipes are dust pipes)

In the second category, (after the wet "spent grain" is separated from the beer and dried in rotary kilns) dust collecting units are incorporated at various stations where this by-product is handled and loaded into freight cars.

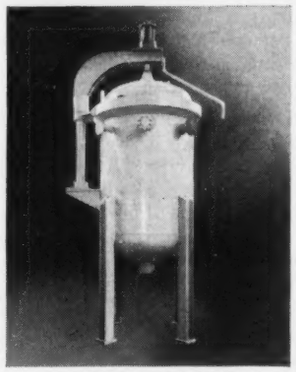
Most of the processing operations mentioned above are fully automatic and controlled from a panel board (see accompanying photo) on 5th floor of building. Indicative of importance of dust control system is that it must be put into operation first before control center can be used to operate other processes.

In addition to this profitable economic function, the collecting system performs valuably in plant housekeeping and maintenance. Cleanliness is promoted, machinery protected and safety engendered. Not a minor point is the fact that air pollution is reduced, with its consequent favorable effect on community relations.

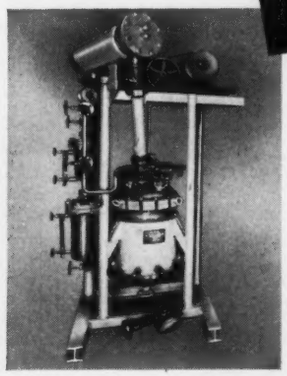
(Courtesy of Pangborn Corp., Dept. CP, Hagerstown, Md. ... or for more information check CP 2586 on handy form, pages 2 and 3.)

Standard or Special Large or Small...

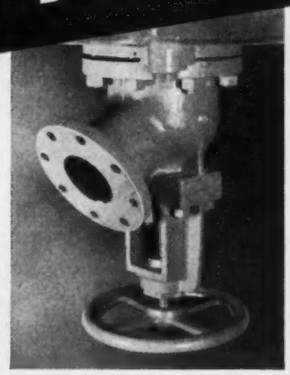
BLAW-KNOX BUILDS THEM ALL!



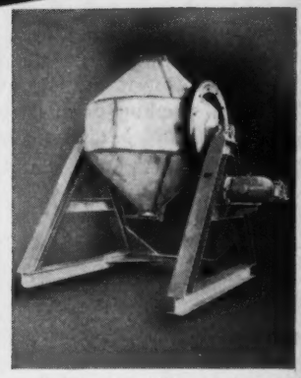
Special Vertical Autoclave for curing safety glass.



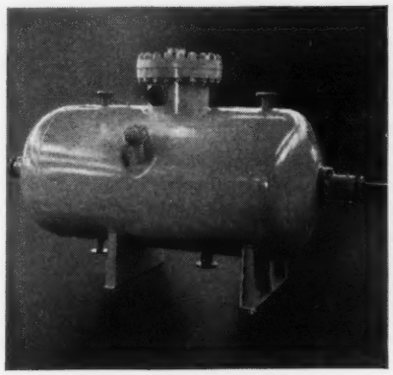
Electro-Vapor® Heated Resin Pilot Plant



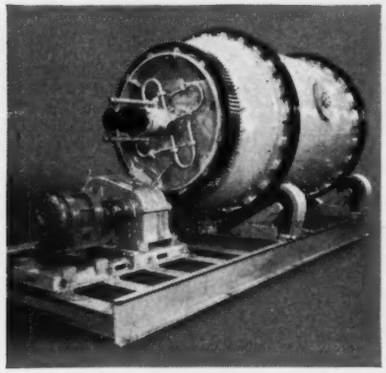
Flush Type Plug Valve



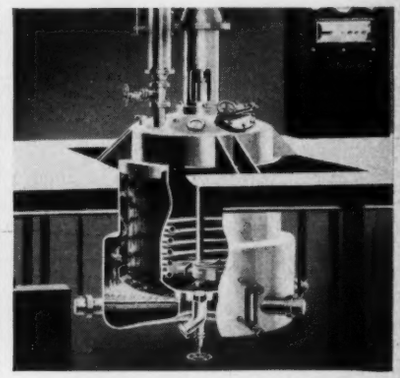
Stainless steel Granulation Blender



Horizontal Jacketed Autoclave with helical type agitation.



Jacketed Rotary Carbonator



Cut-away view of Electro-Vapor® heated Reaction Kettle.

EQUIPMENT FOR: Distillation • Cracking • Gas Cleaning • Solvent Extraction • Solvent Recovery • Heat Transfer • Gas Absorption • Polymerizing • Evaporation • Crystallization • High Pressure Processing • Impregnating and other processes

Do you need a ½-gallon laboratory autoclave? Or a commercial unit of several hundred gallons capacity? Blaw-Knox has the extensive manufacturing facilities and engineering experience to furnish processing equipment which will meet your requirements in every respect. In addition to standard units we also fabricate special equipment to specifications. For further information write for Bulletin 2383.

PROCESS EQUIPMENT DEPARTMENT
BLAW-KNOX DIVISION of Blaw-Knox Company
2076 Farmers Bank Bldg., Pittsburgh 22, Pa.
Other Offices in Principal Cities

BLAW-KNOX PROCESS EQUIPMENT

When inquiring check CP 2587 on handy form, pgs. 2-3

When you're thinking of

ION-EXCHANGE

make Dorr's experience a part of your plan—

Equipment for the increasing use of ion-exchange techniques in the chemical process industries is being continually developed and improved by Dorr engineers. Whenever you are thinking of ion-exchange make use of our experience . . . from problem analysis to initial plant operation.

One of these developments is the ion-exchange cell shown here . . . a typical Dorr design for chemical applications. Its exclusive features provide . . .

- **Minimum dilution of solutions** treated, through use of air-dome operation with automatic level control.
- **Maximum use of cell volume** by elimination of inert supporting medium for exchange resins, through use of non-clogging under-drain distributors.

Better tools TODAY to meet tomorrow's demand

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When inquiring check CP 2588 on handy form, pgs. 2-3

CONSTRUCTION

Fast-setting floor patch contains metallics and rubber . . .

no mixing necessary, no water required; use as is

Uses: Floor patch.

Features: Fast-setting characteristics: within 5 to 10 minutes after tamping, truckloads up to 20 tons may be driven over patched areas without fear of powdering, rolling, or releasing of the patch in any way.

Description: In using Das-Patch, the hole or fissure is swept clean and a primer brushed in. After this has set a few minutes, Das-Patch is used as taken from the drum and tamped level after the hole is filled. Mixing is not necessary, nor is water required.

Das-Patch contains both metallics and pure rubber latex. It can be applied to wet or dry cement, concrete, asphalt, brick or mastic floors by a single worker. It is stated to have a strength approximately 250% greater than conventional floor patch materials.

(A product of Dasco Company, Inc., Dept. CP, 1602-04 Thames St., Baltimore 31, Md. . . . or for more information check CP 2589 on handy form, pages 2 and 3.)

Flexible and compact, unit takes heavy loads of electricity . . .

split-bus circuit breakers use no main disconnect

Uses: Acts as flexible, compact unit to control large electrical loads in commercial installations.

Features: Unit provides for a maximum of six service subdivisions without a single main disconnecting means.

Description: Split-bus circuit breaker plug-in panelette incorporates a "service section" with 200-amp main busses. Two 50-amp, 2-pole circuit breakers are pre-installed in the service section, each wired to a set of split busses in the distribution section which accommodates a total of 16 single-pole or a combination of single- and double-pole lighting or appliance branch circuits.

Four additional 2-pole circuit breakers can be installed in service section to feed heavy duty loads. Units are thermal-magnetic, plug-in type, UL approved, and are available in flush or surface mounting for 120-240v AC, single-phase 3-wire systems.

(Split-bus panelette is developed by The Square D Company, Dept. CP, 6060 Rivard St., Detroit 11, Mich. . . . or for more information check CP 2590 on handy form, pages 2 and 3.)

NOW . . . FOR FAST SURE CHEMICAL PROTECTION

OVER METAL SURFACES

DAMP or DRY
NEW or OLD
PAINTED or BARE
CORRODED or CLEAN
EXTERIOR or INTERIOR

Acts as both primer and finish
For all metal painting including
galvanized, aluminum, iron or steel.

TOTRUST

INSTANT DRY METAL COAT

- Dry for use in 10 minutes.
- Penetrates existing rust pits to stop rust.
- High resistance to most chemical fumes and spillage.
- Has the durability of full rubber base paints.
- Easy to apply as oil paints.
- Chemical resistance equal to most vinyls.
- Eliminates sand blasting, strong odors and the need to remove previous coats of paint.

Comes in 6 colors, zinc chromate and aluminum

For use over all metal surfaces, including:

Exterior of Processing or Storage Tanks; Piping, Blowers, Ducts, Processing Equipment, Structural Steel, Ventilators, Fire Escapes.

Write for descriptive folder No. 255P today.

THE WILBUR & WILLIAMS COMPANY
BOSTON 35, MASS.

When inquiring check CP 2591 on handy form, pgs. 2-3

Incorporate safety features in threading mechanism for pipes, bolts . . .

semi-automatic chuck eliminates bars and T-wrenches for chucking pipe

Uses: For threading of pipe from 1/4 to 2", with an extra range of 1/8", and for threading bolts from 1/4 to 1 1/2".

Features: Ease of operation through "Auto-Grip" chuck and front cutting die-head. Chuck is automatic in gripping action.

The unit is equally effective on steel, iron, or galvanized pipe.

Description: Machine can thread both ends of pipe nipples as short as 3 1/2" in the 2" size, or pipe and studs as short as 2 1/2" can be held and threaded on one end. Model 782 is a floor type threading machine powered by a 2 hp, 2-speed motor (900-1800 rpm). Spindle speeds of

Automatic chuck on pipe and bolt threading machine requires no wrench

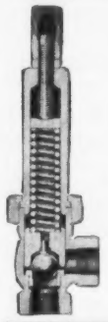
25, 50, 100, and 200 rpm. Motor control consists of non-reversing magnetic starter, start-stop switch, and speed selector switch. Spindle, shafts and worm gear are mounted in ball bearings. Two quick-opening, fully adjustable die-heads and four sets of high-speed steel dies cover standard pipe range.

Reamer attached to die-head is removable for easy grinding. Cutter is roller type, self-centering with length gage. (Blade type cutter available as special equipment.) Front chuck is "Auto-Grip" wrench-less type; rear chuck is universal, centering. Oil pump is internal gear type with relief valve.

(Product of the Oster Manufacturing Co., Dept. CP, 2032 E. 61st St., Cleveland 3, Ohio . . . or for more information check CP 2592 on handy form, pages 2 and 3.)

LOOK INTO *Edward* FORGED STEEL VALVES

For Design Features That Keep Costs LOW—Performance HIGH



Edward
RELIEF VALVES

Fig. 141 Series... Rating of 600 lb sp at 850 F in sizes 1/4 in. to 2 in., inclusive—Stainless steel seat and ball disk—foolproof functional design and accurate spring action assure positive relieving action—alloy steel springs available for temperatures over 400 F—globe and angle designs.

Edward
STRAINERS

Fig. 128 Series... Rating of 600 lb sp at 850 F with screwed or socket welding ends—stainless steel screen approximately seven times that of internal diameter of pipe gives extra large screening capacity—may be installed in vertical or horizontal pipe lines—built in sizes 1/4 in. to 2 in., inclusive—forged steel—globe-type design.

Edward **GLOBE AND ANGLE VALVES**

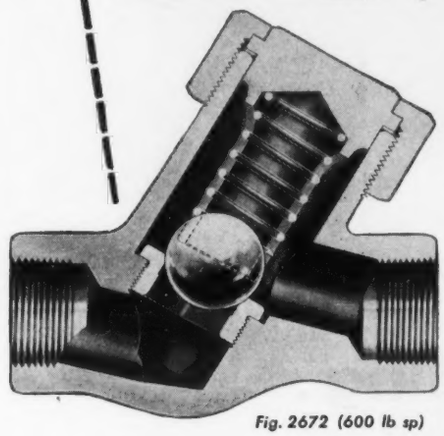
Fig. 444-48 Series... Edward forged steel globe and angle valves are available in stop, needle or stop-check types. Union or bolted bonnet construction, screwed or socket welding ends and 13% chromium stainless steel seat and disk. Their design, with stem at 60° to line of flow, allows approximate straight-through flow and consequent savings because of low pressure drop and minimum turbulence. Built in 600 and 1500 lb sp series at 850F and in sizes 1/4 in. to 2 in. inclusive.

Edward
GAGE VALVES

Fig. 152-3 Series... Ratings of 4000 lb WOG at 150 F or 600 lb sp at 750 F—carbon steel, 13% chromium stainless steel or 18-8 stainless steel bodies—13% chromium stainless steel semi-needle stem-disk—sizes 1/8, 3/4, 1/2 in. have safety taper threaded bonnet joint—1/4 and 1 in. sizes have union bonnet—globe and angle designs.

YOU NEED THIS!

FOR COMPLETE INFORMATION on all Edward Steel Valves, write to Edward, Department CP, for 28-page comprehensive catalog #104, there's no obligation, of course.



EDWARD BALL AND PISTON CHECKS

Forged steel. 600 and 1500 lb sp at 850F or 2000 and 3600 lb at 100F respectively. Bolted or union bonnet. Screwed or socket welding ends. For vertical or horizontal lines. Sizes 1/4 to 2 inch inclusive.

Fig. 2672 (600 lb sp)

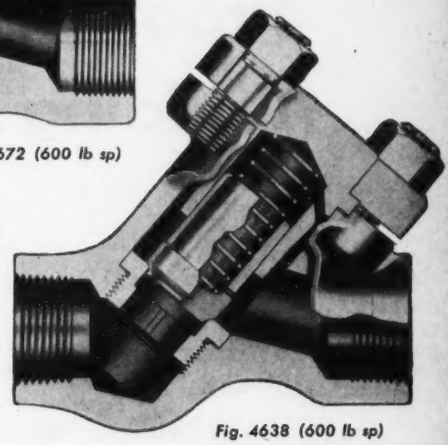


Fig. 4638 (600 lb sp)

OTHER BALL AND PISTON CHECK SERIES

Edward forged steel ball checks are also available for 6000 and 7500 lb at 125F. Sizes 1/4 through 2 inches.

Edward cast steel piston checks are available for 300 and 600 lb sp at 800F and up to 2500 lb sp. Sizes 2 1/2 through 16 inches.

Edward Gives You:

EXTRA-VALUE FEATURES: Simply designed parts, precision construction, foolproof assembly—make these Edward checks ideal for small check valve service.

Look for these extra-value features: heat-treated, non-porous forged steel bodies and components; stainless steel balls, disks and springs; steel ribs for accurately guiding disks and extra strong and long spring for sure closing action; simple, easy disassembly if needed; accessible, removable seat and many others. Edward check valve design is proven and universally accepted. Write for catalog.

A Product of Edward Valves, Inc., 1230 West 144th Street, East Chicago, Ind.

Edward Valves, Inc.

Subsidiary of ROCKWELL MANUFACTURING COMPANY

EAST CHICAGO, INDIANA

When inquiring check CP 2593 on handy form, pgs. 2-3

Proof of the Pudding . . .

The ever increasing number of GB Process Equipment installations bears witness to the confidence placed in us by the industry. This position of leadership has been attained by attention to design details, careful shop fabrication, cooperation at start up and continued interest and service through the long life of the equipment.

GOSLIN-BIRMINGHAM
MANUFACTURING CO., INC.
BIRMINGHAM, ALABAMA
CHICAGO: F. M. deBeers and Associates, 20 N. Wacker

When inquiring check CP 2594 on handy form, pgs. 2-3

CONSTRUCTION

Claim life expectancy of 5 yr for Si-base water repellent . . .

makes walls practically self-cleaning; eliminates efflorescence

Uses: Imparts water resistance to: brick, concrete, sandstone, limestone, stucco, cement-base paints, asbestos-cement combinations, and other similar compositions.

Features: It is claimed that product actually penetrates masonry up to ¼" — lining the minute particles of the masonry structure with silicone resins, but *not* plugging the pores. Based on accelerated weathering tests and actual results to date, life expectancy is 5 years.

Description: Flexseal is a silicone-base water repellent which is said to be completely invisible on drying. It can be applied summer or winter, in temperatures as low as 15°F, to any wall whose surface is dry.

Flexseal treatment is stated to make walls practically self-cleaning and to eliminate efflorescence and other water-soluble or water-carried stains.

(Available from Flexrock Co., Dept. CP, 36th and Filbert Sts., Philadelphia 4, Pa. . . . or for more information check CP 2595 on handy form, pages 2 and 3.)

Tough plastic sheet is practically shatterproof . . .

easy to machine, saw, drill, nail, or glue

Uses: May be fabricated into ducts, pipe, tube, tanks, or into molding shapes.

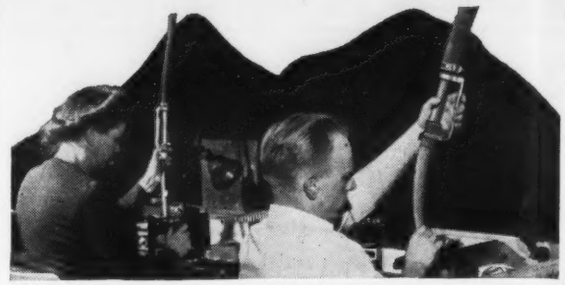
Features: Easy to machine, saw, drill, nail, or glue.

Description: Iolyte polyester laminated sheets are available in continuous strips of any desired length and thicknesses from 8 mil to ¼ inch or more. It may be ordered in sheets, rolls, or tape.

Iolyte is stated to have the tensile strength of steel and will withstand continuous exposure to temperatures up to 350°F. It has low water absorption, good electrical properties, and is highly resistant to chemicals.

It is practically shatterproof, scratch-proof, and stainproof. May be ordered in any color, translucent or opaque.

(Available from Industrial Organics Corp., Dept. CP, 59-31 54th St., Maspeth 78, N. Y. . . . or for more information check CP 2596 on handy form, pages 2 and 3.)



MOVING MOUNTAINS

with Spencer Vacuum

Yes — Spencer Vacuum is moving chemicals, hot materials and just plain debris by the ton. But the biggest mountains of industry are plant housekeeping and sanitation. Whether it's 500 acres in a chemical plant to be cleaned every night, or the few specks of dust that cause rejects in ceramic and instrument plants — Spencers are doing the job with less man power.

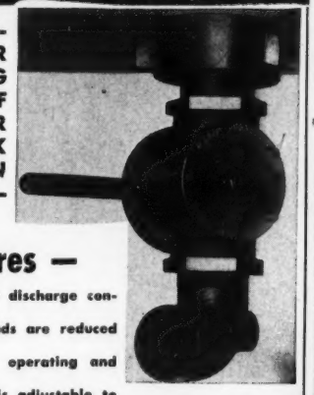
Ask for Bulletin No. 144—it describes 132 applications.

THE SPENCER TURBINE COMPANY • HARTFORD 6, CONNECTICUT
SPENCER HARTFORD
439-M

When inquiring check CP 2597 on handy form, pgs. 2-3

Cornell VALVE-TYPE TANK CAR UNLOADING FITTING

A SAFETY VALVE-TYPE FITTING FOR SAFE UNLOADING FOR ALL TYPES OF MATERIALS (HOT OR COLD) FROM TANK CARS — ONE MAN OPERATIONS — LIGHT WEIGHT.



Special Features —

- ★ Flow is controlled at car discharge connection.
- ★ Standard Tank Car Threads are reduced to 2" and 3" pipe.
- ★ Plug-Type valve is fast operating and self-draining.
- ★ Plug clearance in valve is adjustable to compensate for handling very hot materials.
- ★ Swivel collar allows the outlet to be pointed in right direction when fitting it tight on car.
- ★ A 1" pipe connection permits air or steam cleaning of lines from car to pump.
- ★ All aluminum construction except valve plug which is brass.

Weight is 19 pounds. Overall length to outlet center is 14½".

MODEL MCV-390 for 3" Outlet.

MODEL MCV-290 for 2" Outlet.

Write for prices and information on special metals and sizes.

MEAD CORNELL AND COMPANY
P. O. BOX 2682C
CLEVELAND 7, OHIO

When inquiring check CP 2598 on handy form, pgs. 2-3

Special service kits are available for four common mechanisms of feedwater systems . . .

make-up, heater, receiver, and complete pump assemblies are all packaged separately

Uses: Designed to operate with high efficiency on any type of steam boiler in reclaiming high and low pressure condensate.

Features: Feedwater system can be purchased complete or in four separate kits for specific jobs, and are compact, flexible units that automatically supply hot make-up water for boiler operation. Maintains a constant uniform water temperature which eliminates the waste of using cold make-up water. By supplying the boiler with pre-heated condensate water, practically distilled, boiler life is prolonged, maintenance costs are reduced, fuel is saved, and stresses of applying cold water to hot surfaces are eliminated.

Description: Pump set assemblies are available for 100, 125, and 150 lb per sq in pressure and for boilers from 15 to 300 hp. Higher pressures can be furnished on order.

Assembly consists of a base-mounted motor, turbine pump, base plate, connecting coupling starter, thermometer, pressure gage, strainer, and two swing-check valves.

Capacity of receiver assembly ranges from 30 to 450 gal and consists of a receiver tank with flanges and openings, gage glass, steam diffuser, and baffle plate. Receiver tank is made from heavy tank steel with welded couplings on the lower sides to hold legs in place. Entire unit is made to permit use with all accessories at once or by adding assemblies when needed. All openings not used are plugged.

Heater assemblies are available in eight sizes ranging from ½ to 2″ capacity. Assembly includes heater, aquastat solenoid valve, and strainer. Six sizes from ½ to 2″ are available in the make-up assembly which includes tank float switch, solenoid valve, and strainer.

(Development of the York-Shipley Inc., Dept. CP, York 4, Pa. . . . or for more information check CP 2599 on handy form, pages 2 and 3.)

Woven of fiberglas, wrap protects subterranean pipes against acid and decay . . .

inorganic membrane fabric resists heat and condensation; is non-shredding

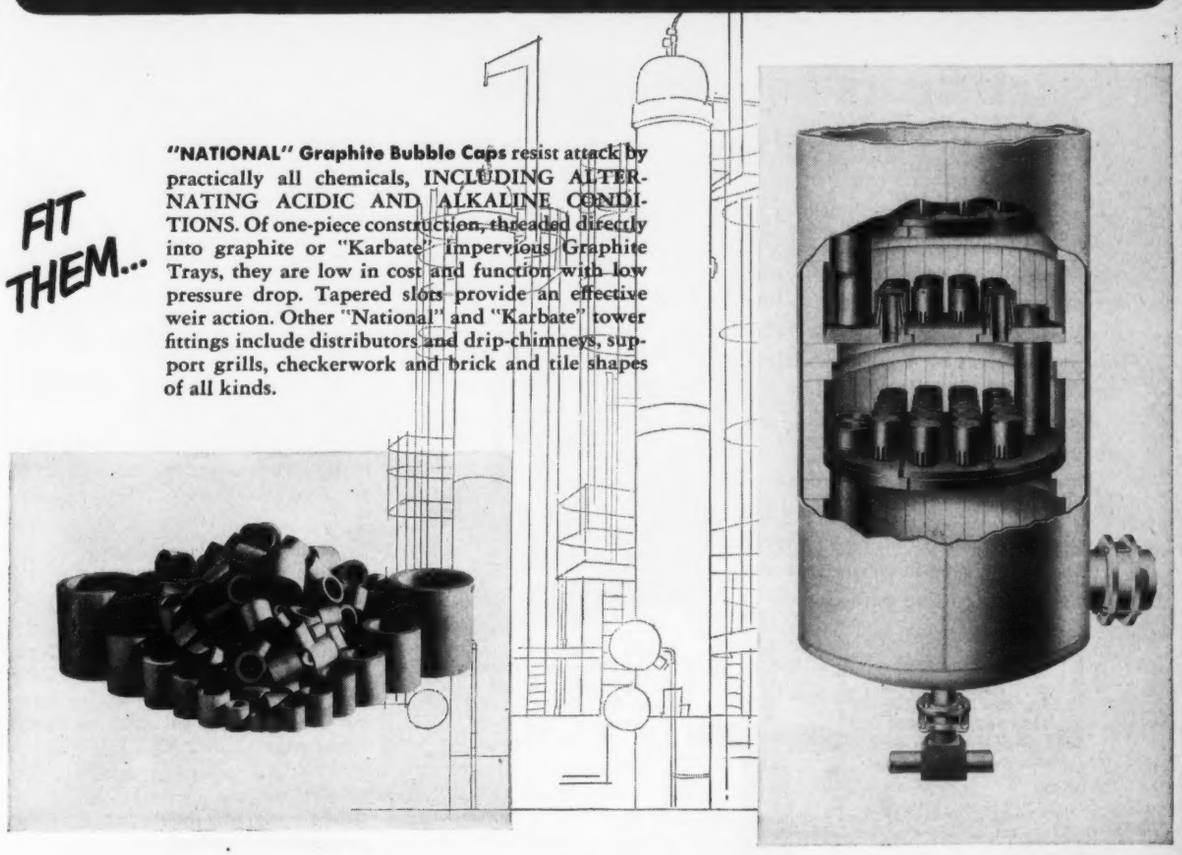
Uses: For protecting pipes underground against corrosion, but can also be used effectively for the same purpose on wood or concrete.

Features: Fabric yarns made from fine, flexible filaments of pure glass withstand repeated cycles of heat, cold condensation, and drying. Material retains its shape like wire cloth, does not shed fibers, and is not irritating to the skin of the workman.

Description: Filaments of open mesh weave are smooth, cylindrical, non-cellular, and non-hygroscopic. A layer of mastic is first applied to the piping (no primer needed), followed by the spiral wrapping of the Glas-Wrap. A second coating of the mastic is then applied by spray or brush over the wrap to increase its resistance to acids, alkalis, stray ground currents and abrasions.

(Product of the Royston Laboratories, Inc., Dept. CP, Blawnox, Pa. . . . or for more information check CP 2600 on handy form, pages 2 and 3.)

For low-cost, trouble-free service in ALL types of tower construction



FIT THEM...

"NATIONAL" Graphite Bubble Caps resist attack by practically all chemicals, INCLUDING ALTERNATING ACIDIC AND ALKALINE CONDITIONS. Of one-piece construction, threaded directly into graphite or "Karbate" impervious Graphite Trays, they are low in cost and function with low pressure drop. Tapered slots provide an effective weir action. Other "National" and "Karbate" tower fittings include distributors and drip-chimneys, support grills, checkerwork and brick and tile shapes of all kinds.

and PACK THEM...

"NATIONAL" Carbon Raschig Rings are immune to acid, alkali, and solvent action; have extremely low coefficient of thermal expansion; are light-weight and strongly resistant to chipping and spalling. They have a very attractive overall cost and long service-life. Eight sizes range from ¼″ to 3″ O.D. Very popular in reaction and scrubbing towers used by the chemical, petroleum and petro-chemical and processing industries.

with NATIONAL CARBON AND TRADE-MARK GRAPHITE AND "KARBATE" IMPERVIOUS GRAPHITE TOWER ACCESSORIES

Low light bills...

. . . mark phenomenal acceptance of the "EVEREADY" No. 1050 Industrial Flashlight Battery by a broad cross-section of industry. Delivering *twice the usable light* of any battery we've ever made before, it will not swell, stick, or jam in the flashlight . . . has no metal can to leak or corrode.

The terms "National", "Karbate" and "Eveready" are registered trade-marks of Union Carbide and Carbon Corporation

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A Division of Union Carbide and Carbon Corporation
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OTHER NATIONAL CARBON PRODUCTS

HEAT EXCHANGERS • PUMPS • VALVES • PIPING • TOWERS • TOWER PACKING • BUBBLE CAPS • BRICK • STRUCTURAL CARBON • SULPHURIC ACID CUTTERS • HYDROCHLORIC ACID ABSORBERS

When inquiring check CP 2601 on handy form, pgs. 2-3

IRON BULWARK

AGAINST CORROSIVE FLUIDS

Fairbanks® all iron gate valves

...are made of high-test alloy iron to withstand the action of many of the strongest chemicals such as concentrated sulfuric acid, alkalies, aniline oils, sodium and potassium cyanides and creosote. These iron body valves give long service under the severe operating conditions that exist with use of these destructive agents.

Fairbanks All Iron Gate Valves—like those in all Fairbanks lines—are low in maintenance cost, easy to operate and long-lasting in service... a real answer to cost-cutting needs today.

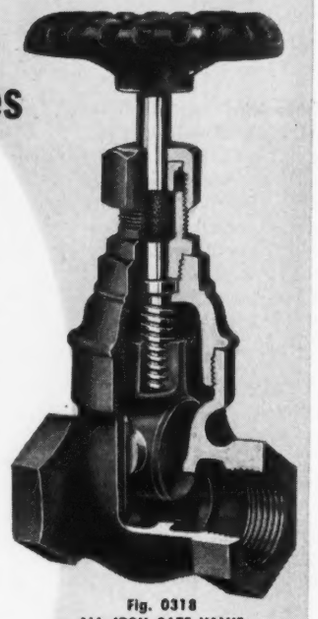


Fig. 0318
ALL IRON GATE VALVE
150# SWP 225# WOG
Non-Rising Stem • Solid Wedge • Taper Seat
½"-2" Sizes

Fig. 0904
ALL IRON GATE VALVE
125# SWP 200# WOG
Solid Wedge • Taper Seat • Malleable Iron Seat Rings
2"-12" Sizes

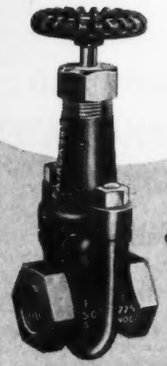


Fig. 0418
IRON BODY U-BOLT GATE VALVE
150# SWP 225# WOG
Bronze Mounted • All Iron Rising Stem • Solid Wedge • Taper Seat
½"-4" Sizes

For handling other types of corrosive fluids such as dry carbon dioxide, ethyl acetate, malt beverages, propane and butane gas use FAIRBANKS BRONZE SOLDER END and FAIRCO-BRAZE (silver-brazed) VALVES.

For full details consult your distributor or write direct

THE Fairbanks COMPANY
393 LAFAYETTE STREET • NEW YORK 3, N.Y.
Branches: New York 3 • Pittsburgh 22 • Boston 10 • Rome, Ga.

CASTERS • TRUCKS • VALVES • DART & PIC UNIONS

When inquiring check CP 2602 on handy form, pgs. 2-3

CONSTRUCTION

Keep Pb from settling out of suspension in lubricant . . .

resurfaces pits and scores in older equipment

Uses: Heavy-duty lubrication.

Features: Extremely high metallic Pb content in the form of a pulverized dust, kept in permanent suspension by the Knapp Process.

Description: Lead-Lube is a homogeneous blend of metallic Pb and other constituents. The metal functions to form self-lubricating surfaces over all the wearing parts of gears and bearings, so that the actual surfaces will be protected from wear. In the case of older equipment, the metallic Pb is stated to resurface pits and scores and restore a degree of efficiency comparable to that which existed before wear.

Lead content of lubricant is also stated to aid materially the resistance to moisture and corrosive chemicals.

A homogenizing process — Knapp Process — related in principle to the flotation process as encountered in ore treatment, led to the perfection of Lead-Lube.

(Produced by Knapp Mills, Inc., Dept. CP, 23-15 Borden Avenue, Long Island City, N. Y. . . . or for more information check CP 2603 on handy form, pages 2 and 3.)

Gives concrete material protection against water, acids . . .

paint dries in 1 hr after applying to dry surface

No primer or sealers are needed when applying manufacturer's #15 concrete paint, designed for interior or exterior use on concrete, cement block, brick, and stone. Coating dries in 1 hr when applied to dry surface; can also be applied to painted or unpainted damp or dry surfaces. Has high resistance to water, acid, or alkaline attack.

Other features of the product are: 1) undamaged by washing, 2) one coat usually covers, 3) makes surfaces easier to clean, 4) provides a tough, long-lasting, semi-gloss finish that protects and decorates. Brushes are cleaned in less than a minute by rinsing in water. One gallon covers 400 sq ft. Available in quart and gallon containers. Color is grey.

(Product of the Smooth-On Mfg. Co., Dept. CP, 570 Communipaw Ave., Jersey City 4, N. J. . . . or for more information check CP 2604 on handy form, pages 2 and 3.)

GAYCO CENTRIFUGAL SEPARATORS

GAYCO Separators, equipped with the adjustable centrifugal sizing fan — an exclusive GAYCO feature — make closer separations. Closer separations bring about higher production through efficient removal of the fines made by the mill. Closer separations bring about higher quality products by eliminating all undesirable oversize.

"TIMKEN BEARING EQUIPPED" GAYCO brings you all these:

Range 60 to 400 mesh

greater capacity

25 to 30% greater production

Cleaner Tailings

Uniform Products

Slow speed for slow wear

Quick and easy adjustments

If you have an exceptionally hard separating problem, TRY THE GAYCO.

Universal Road Machinery Co.

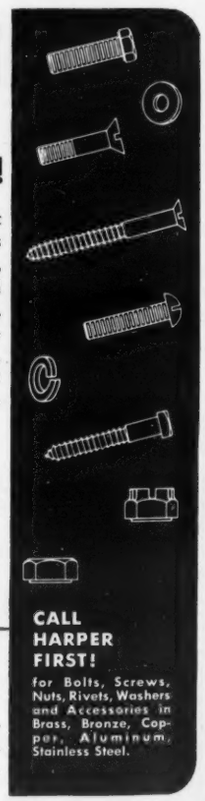
Rubert M. Gay-Division
Factory and Laboratory, Kingston, N. Y.
117 LIBERTY STREET NEW YORK 6, N. Y.
Canadian Representative: F. H. Hopkins & Co., Ltd., 8500 Decarie Blvd., Montreal, Que.

When inquiring check CP 2605 on handy form, pgs. 2-3

HARPER

Specialist in *all* Non-Corrosive Fastenings!

Call Harper *first!* America's largest producer of non-ferrous and stainless steel fastenings—specializing in bolts, screws, nuts, rivets, washers and accessories in brass, bronze, copper, aluminum, Monel, stainless steel—to solve your problems in corrosion, heat, abrasion and stress. Over 7,000 items stocked by warehouses and distributors from coast to coast.



FREE—*this 56-page Harper Price List and Stock Book.*

The H. M. Harper Company
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Rush Harper Price List and Stock Book.
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CALL HARPER FIRST!
for Bolts, Screws, Nuts, Rivets, Washers and Accessories in Brass, Bronze, Copper, Aluminum, Stainless Steel.

When inquiring check CP 2606 on handy form, pgs. 2-3

Rust preventive lets moisture escape from pores of metal . . .

doesn't remain under film to corrode, doesn't condense on top and erode film

Uses: Rust preventive easily applied at room temperature to machinery, machine parts, tools, or any metal surface.

Gives complete protection against salt spray (840 hours continuous salt spray in desiccator) and is strongly resistant to acid fumes. Used for protection of export shipments (not open deck), storage along sea coast, storage near pickling equipment or where there is likelihood of acid fumes. Gives sufficient protection along sea coast to store metal on dunnage covered by tarpaulin.

Features: Has the unique property of absorbing and evaporating moisture from the pores of the metal. It thus overcomes the major handicap of most rust preventives that seal in moisture under the protective coating. This same feature is responsible for preventing erosion of the protective film due to condensation of atmospheric moisture — as when drops of water form on the film and run off, carrying some of the film with them.

Description: Stop-Rust No. 0 Special (not a petroleum base) absorbs the moisture trapped in the pores of metals and floats it to the surface for evaporation. It is applied by brush, dip, spray, or wiping, and is easily removed by conventional solvents such as kerosene or Stoddard solvent.

It is clean, easy to handle, not messy or slick, and not harmful to hands. Coverage is reported to be 1200 square feet per gallon.

(Product of The Stop-Rust Company, Dept. CP, P.O. Box 494, Chattanooga, Tenn. . . . or for more information check CP 2607 on handy form, pages 2 and 3.)

Uses 98% less water in providing air conditioning comfort with easy control . . .

conditioner section cools, dehumidifies, and circulates air; or can heat, filter, humidify

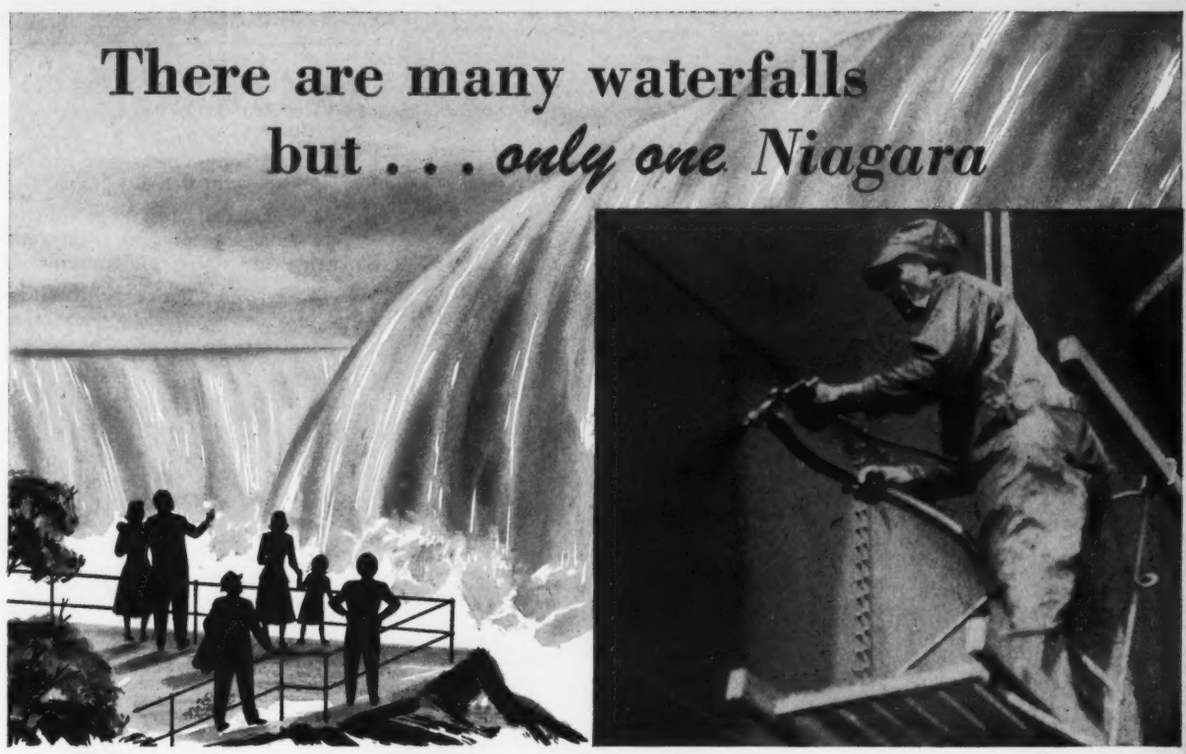
Uses: For year-around air conditioning where water is scarce or has unusually high temperature.

Features: Evaporative condenser utilizes moisture condensed from the atmosphere by the cooling coil to cut overall water consumption by as much as 98% on humid days. Unit operates automatically after being turned on.

Description: In either the 10, 15, or 20 ton models, heart of the unit is multi-step reciprocating compressor designed to reduce power consumption automatically when less cooling is required. Frequent stops, starts, and short cycling are minimized to lengthen motor life. Evaporative condenser's fan motor and pump are mounted in the conditioner-compressor section in order to assure protection against moisture.

Cooling coils and optional heating coils are of standard fin and tube construction, with permanent, solderless, mechanical bond. Large low-speed fans, with adjustable speed to meet varying duct resistance, are balanced statically and dynamically. Filters, heating and cooling coils, face and by-pass dampers, and other components may be specified to fit requirements of individual installations. Unit arrives completely wired, charged, and ready to run as soon as simple connections are made.

(Product of the Trane Company, Dept. CP, La Crosse, Wis. . . . or for more information check CP 2608 on handy form, pages 2 and 3.)



There are many coatings but . . . only one INSUL-MASTIC

INSUL-MASTIC pioneered heavy coatings—of *superior* quality. Years of thorough testing and experimentation, by corrosion plagued chemical companies, proved conclusively that long term protection against acids, alkalis and weather was at long last possible, through the use of INSUL-MASTIC.

The government confirmed this finding—INSUL-MASTIC being the only mastic coating ever approved under the original rigid specification for "mothballing" the war materiel.

INSUL-MASTIC *superior* coatings brought about changes in coating specifications throughout industry. The extremely long life and very low moisture vapor penetration rate of INSUL-MASTIC were the qualities that industry was seeking in its fight against corrosion and moisture penetration. The proven formulae which brought this enduring protection are patented and *cannot be duplicated* . . . there is only *one* INSUL-MASTIC.

Tests by the National Bureau of Standards and other impartial laboratories* prove the value of INSUL-MASTIC's basic ingredients for increasing coating life. Those ingredients are a maximum percentage of Gilsonite and *carefully* chosen mica and asbestos.

INSUL-MASTIC Vaporseal Coatings will prevent corrosion under severe chemical conditions, and will vaporseal insulation or building walls.

INSUL-MASTIC Type "D" Insulation will control condensation or prevent 65% of heat loss.

There is only *one* INSUL-MASTIC—Write for the name of our nearest licensee.

Think first of the coatings that last!

* *Names on request*

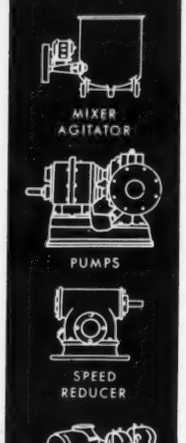
Insul-Mastic Corporation
OF AMERICA
1165 OLIVER BUILDING · PITTSBURGH 22, PA.
Representatives in Principal Cities

When inquiring check CP 2609 on handy form, pgs. 2-3

The John Crane Type 9 Seal is designed to meet corrosive and high temperature conditions. That's because its flexible wedge and sealing rings are molded of the spectacular new plastic, Teflon, which is not affected by any industrial chemical, including solvents.

This revolutionary seal is the successful development of two years research and field testing. It's a perfect blend of John Crane experience in designing mechanical seals with the unique properties of Teflon: chemical inertness, extremely low friction and high heat resistance. Type 9 Seal can be employed at temperatures up to 500°F.

The result is a new, efficient way to handle corrosive liquids and gases that never before could be effectively controlled by conventional, flexible-type mechanical seals.



Prevents Leakage of:

EXPENSIVE CHEMICALS
INFLAMMABLE LIQUIDS
TOXIC GASES
CORROSIVE LIQUIDS
SOLVENTS

Other John Crane Teflon Products include expansion joints, C-V Rings, packings and gaskets. Also, parts molded or machined to your particular requirements.

Write today for New Booklet describing the John Crane Type 9 Shaft Seal.....

JOHN CRANE
CRANE PACKING COMPANY
1821 CUYLER AVE. • CHICAGO 13, ILLINOIS
Offices in All Principal Cities in United States and Canada

When inquiring check CP 2610 on handy form, pgs. 2-3

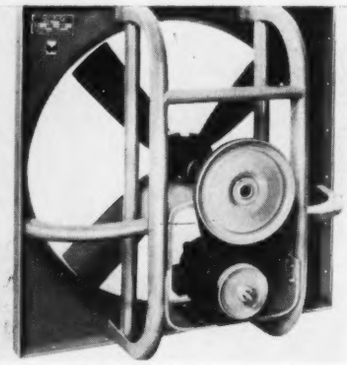
CONSTRUCTION

Quiet running exhaust fan does heavy duty in ventilation . . .

belt-driven units give up to 28,000 cfm delivery

Uses: For delivering large volumes of air under static pressure (duct work, mine exhaust systems, filtering units.)

Features: Running on ball bearings and belt driven, fans are quieter in



Power line exhaust and pressure fan

operation than those of direct drive.

Description: Equipped with non-overloading cast aluminum airfoil type propellers, units are available in sizes from 24 to 48" and with air deliveries from 5000 to 28,000 cfm. Motors are totally enclosed.

(Product of the Chelsea Fan and Blower Co., Inc., Dept. CP, 639 South Ave., Plainfield, N. J. . . . or for more information check CP 2611 on handy form, pages 2 and 3.)

Reclaims metal dross, effects cleaning . . .

tones metal and gives definite spider web appearance

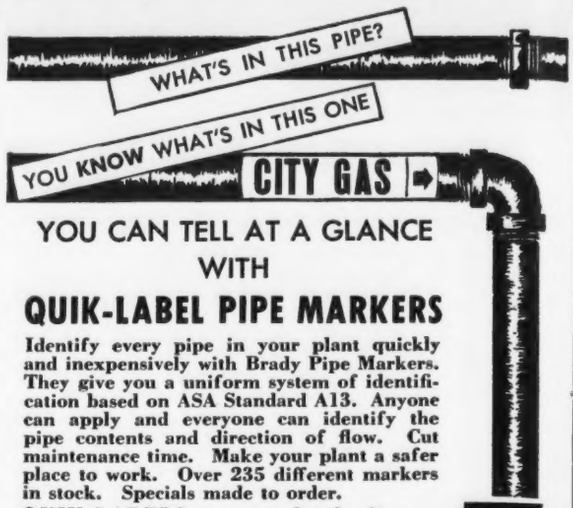
Uses: Metal dross reclaimer.

Features: Simultaneous cleaning action.

Description: Slago removes the impurities from slag and converts back to metal the dross of tin, lead, zinc, and antimony. Cleaning effect is brought about by the balancing in the formula of a constituent known as "Spirits of Metal". Latter is stated to definitely tone the metal and give it a clean, spider web appearance.

Slago prevents excess loss of either tin, lead, zinc, cadmium, or antimony by oxidation, because the dross is reduced to metal at a lower temperature.

(Available from Farrelloy Co., Dept. CP, 1260 North 26th St., Philadelphia 21, Pa. . . . or for more information check CP 2612 on handy form, pages 2 and 3.)



YOU CAN TELL AT A GLANCE
WITH
QUIK-LABEL PIPE MARKERS

Identify every pipe in your plant quickly and inexpensively with Brady Pipe Markers. They give you a uniform system of identification based on ASA Standard A13. Anyone can apply and everyone can identify the pipe contents and direction of flow. Cut maintenance time. Make your plant a safer place to work. Over 235 different markers in stock. Specials made to order.

QUIK-LABELS come on handy dispenser cards. They are printed in large black letters on approved ASA background colors. Applied in a jiffy—they stick without moistening. Use indoors or outdoors. Cost only a few cents per marker.

WRITE FOR Free SAMPLES AND USEFUL CATALOG

DISTRIBUTED IN 125 PRINCIPAL CITIES
MANUFACTURERS OF SELF-STICKING PRODUCTS
WIRE MARKERS
PIPE MARKERS
SAFETY SIGNS
PRINTED ROLL TAPE
MASKS & STENCILS
W. H. BRADY COMPANY
EST. 1914
1625 E. SPRING STREET • CHIPPEWA FALLS, WIS.

When inquiring check CP 2613 on handy form, pgs. 2-3

Buckingham
***Thread* Restorer**

Now — no more drilling or hack sawing to replace damaged male threads! Buckingham Thread Restorer eliminates flats and nicks — cleans heavily rusted and corroded threads on studs, bolts, pipes, threaded shafts.

Simple — quick. Just slip on a Buckingham Thread Restorer at bottom of damaged area and back-off. Jaws adjust to any pitch — SAE, ASME, pipe or tapered. One tool handles many sizes . . . no die sets needed!

Eight models for ¼" to 6" threads. Write for free folder and name of nearest dealer.

BUCKINGHAM MANUFACTURING CO., INC.
51-53 Travis Street Binghamton, N. Y.

When inquiring check CP 2614 on handy form, pgs. 2-3

Tests water hardness during zeolite softener run and signals result . . .

with manual or selective automatic softeners, it will warn that regeneration is required

Uses: Determination of status of a zeolite softener run.

Features: Simple operation and design, low initial investment, and flexibility of application.

Description: Hydramizer takes a sample of water and makes a soap test. If the water is hard a red light appears, and if it is soft a green light glows. For automatic softeners, it will actuate the automatic valves. With manual

Foot-ruler laid next to unit demonstrates compact design

or selective automatic softeners, it will warn the operator with a bell that regeneration is required.

Compact design allows unit to be placed anywhere on a stand or shelf in the vicinity of the softener. Other than filling of soap container, no routine maintenance is required. Operation may be checked at a glance through window.

(Manufactured by Refinite Corp., Dept. CP, Omaha, Neb. . . . or for more information check CP 2615 on handy form, pages 2 and 3.)

Combination of $Mg(Cl)_2$ and MgO makes quick-setting, durable, hard cement . . .

flooring material resists oils and greases, has high structural strength and long life

Combination of magnesium chloride and magnesium oxide with certain fillers and fine aggregates produces a cement that sets in a few hours and forms a hard, dense, durable mass as a flooring material. This type of cement, composed of balanced hard-rock fractures bedded in a matrix of mineral and vegetable fibers, is marketed under the name of Magna-Crete and is supplied in dry form to be mixed on the job to mortar consistency, then spread, leveled, and finished by trowelling.

Material is said to be comparatively lightweight, has good bonding qualities, resists oil and greases, has high structural strength, and a granite-hard surface for long life.

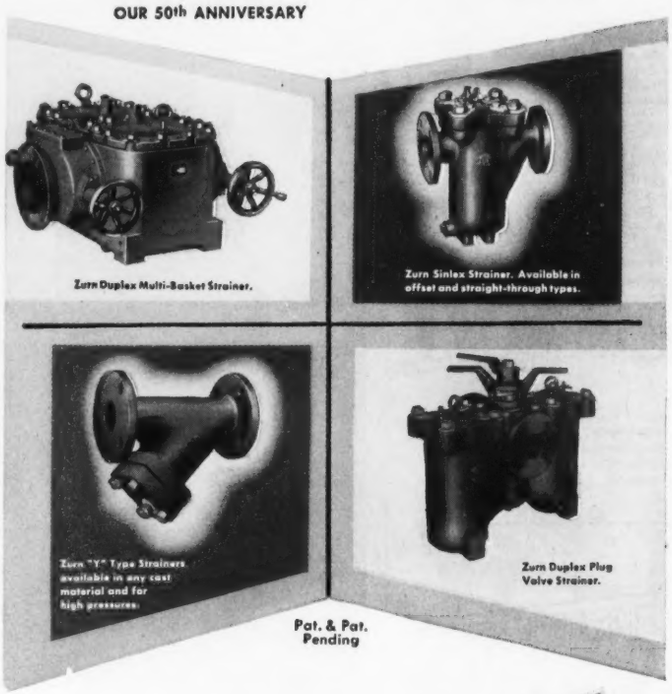
(Development of the Flash-Stone Company, Inc., Dept. CP, 3723 Pulaski Ave., Philadelphia 40, Pa. . . . or for more information check CP 2616 on handy form, pages 2 and 3.)

ENGINEERED

To Permit High Rates of Flow With Remarkably Low Pressure Drop

ZURN LOW PRESSURE DROP STRAINERS

OUR 50th ANNIVERSARY


Zurn Duplex Multi-Basket Strainer.
Zurn Sinlex Strainer. Available in offset and straight-through types.
Zurn "Y" Type Strainers available in any cast material and for high pressures.
Zurn Duplex Plug Valve Strainer.
Pat. & Pat. Pending

IMMEASURABLY IMPROVE THE HANDLING OF FLUIDS (OIL, CHEMICALS, WATER) THROUGH PIPE LINES

Now, a reduction of pressure loss can be obtained by the installation of Zurn Engineered Strainers. Design improved for correct circularity, smooth inner walls combined with correctly sized and perforated baskets reduce pressure loss and afford maximum protection for all types of mechanical units connected with pipe lines.

Zurn Strainers, are held to close manufacturing tolerances for materials, shape, and dimensions assuring the utmost in strength and safety. Zurn Strainer applications include fluid handling lines for lubricating and fuel oil, and oil during the refining process; a wide range of chemicals produced and used by the various process industries; public utility power plants; power stations; industrial plants; municipal water systems; ships and high temperature, high pressure installations. Zurn Fluid Handling Engineers are available for consultation on your fluid handling problems.

Write for Pipe Line Strainer Manual No. 951, including previously unpublished pressure drop data.

J. A. ZURN MFG. CO.
INDUSTRIAL DIVISION • ERIE, PA., U. S. A.
In Canada: Canadian Zurn Engineering Ltd., Montreal, P. Q.

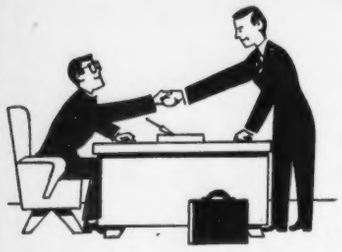
J. A. ZURN MFG. CO.
Industrial Division; Erie, Pa., U. S. A.
Please send me Pipe Line Strainer Manual No. 951

Name_____
Position_____
Company_____
Street_____
City_____ State_____
Please attach to your business letterhead—Dept. CP

Copyright 1952

When inquiring check CP 2617 on handy form, pgs. 2-3

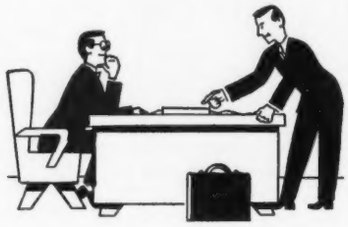
HOW PROCTOR RESEARCH MAKES POSSIBLE "GUARANTEED DRYER PERFORMANCE"



Your telephone call or letter to Proctor & Schwartz, Inc. will place you in immediate touch with a sales engineer who is thoroughly acquainted with the needs of your type of plant.

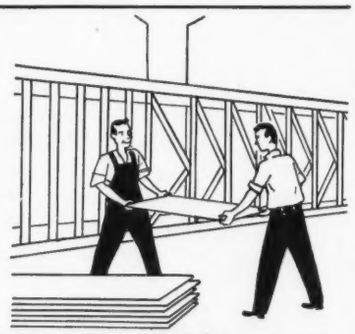
As a result of his interview tests will be conducted by the engineers in our research department where all of the latest equipment and data are available. You may even come to the lab yourself.

Based on test results, preliminary plans will be made by competent engineers to determine the size and kind of equipment needed together with approximate cost figures.



Having kept close touch with research and preliminary engineering the sales engineer will present recommendations to you. Together you will discuss these in terms of meeting your specific requirements.

Once your order is placed the equipment will be designed in exact detail so that the finished machine will meet your individual requirements—and perform exactly as guaranteed in the sales agreement.



Intelligent interpretation of plans on the part of the Proctor men who build your equipment is the final touch to producing the finest possible equipment—engineered and built to meet your individual requirements.

PROCTOR & SCHWARTZ, INC.

663 TABOR ROAD • PHILADELPHIA 20, PA •

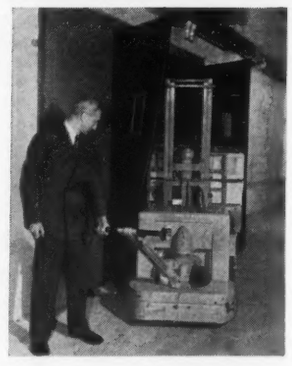
When inquiring check CP 2618 on handy form, pgs. 2-3

Bump 'em, bang 'em, even bend 'em inflatable rubber doors bounce back undamaged . . .

eliminate maintenance of wood doors, prevent infiltration of warm air into storage rooms

Inflatable rubber batten doors, the idea of a Cambridge, Massachusetts inventor, are almost immune to damage despite repeated bumping by trucks. The common practice, in cold storage and processing plants, of banging doors open causes such wear and tear that the now familiar steel plate surfacing was adopted. As such doors continue to succumb to the battering ram action of trucks, the average amount of plating has been increased from time to time.

Because of great resiliency, the rubber door stands the tremendous impact imposed by mechanized handling methods. It swings back quickly, bends and "gives" to hard



Inventor of inflatable rubber door demonstrates its flexibility and how easily it swings open to admit power truck, bending without damage

blows much like a skilled boxer "rolls" to take the knockout threat out of a hard punch. As the rubber door's weight is about one-third that of conventional metal protected swinging doors, there is so little inertia that the pressure of one finger opens it. Breakage of hardware and

YOUR KEY SOURCE FOR INDUSTRIAL WIRE CLOTH— Cambridge

In bulk—Cambridge wire cloth is available in any metal or alloy, in a wide range of sizes, from 20 x 250 mesh up to 4" openings, and in 9 basic weaves. Individual operators for each loom mean dependable uniformity of mesh count; thorough inspection before shipment further assures accurate adherence to your specifications. Years of experience guarantees a thorough understanding of your requirements. Many widely used types of weave and mesh are kept in our warehouse stock . . . ready for immediate shipment.

In fabricated parts—We'll quote on your specifications for shaker screens, filter leaves, sizing screens, or other fabrications . . . or, just give us the details of your product and processing and we'll design the part to do the job. For information or assistance on any problem involving industrial wire cloth rely on your Cambridge Field Engineer. See "Wire Cloth" in your classified telephone directory or write direct.

Send today for FREE illustrated catalog describing Cambridge industrial wire cloth and facilities for fabricating special wire cloth parts.

The Cambridge Wire Cloth Co.

Dept. F • Cambridge 5, Md.

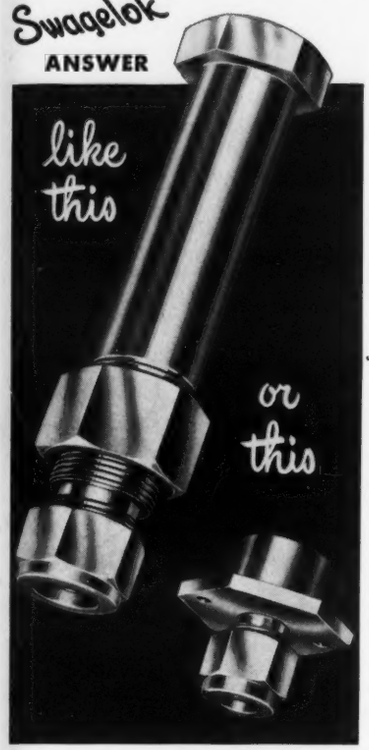
WIRE CLOTH | METAL CONVEYOR BELTS | SPECIAL METAL FABRICATIONS

OFFICES IN PRINCIPAL INDUSTRIAL CITIES

When inquiring check CP 2619 on handy form, pgs. 2-3

GOT A DIZZY FITTING PROBLEM?

Consult Crawford Tube Fitting Specialists—And Get The Swagelok* ANSWER



Try to stump us! For "specials" send your tube fitting problems to us and let our engineers design a Swagelock Special that will do the job. Ask for FREE catalog. Dept. 42.

* Patented

CRAWFORD FITTING CO.
884 E. 140th Street, Cleveland 10, Ohio

SWAGELOK FITTINGS AVAILABLE IN: BRASS, ALUMINUM, STEEL, STAINLESS STEEL, MONEL

COME TO YOU COMPLETELY ASSEMBLED, FINGER TIGHT

When inquiring check CP 2620 on handy form, pgs. 2-3

frames frequently experienced on the usual heavy metal protected door is avoided.

When lift trucks cut corners too closely in passing through heavy doors that can be opened only 90°, doors will not give, thus threatening damage to hardware or frames. Photo shows how inflatable doors bend easily under pressure of truck.

Actually the door is a reinforced rubber air container, constructed of an outer layer of rubber, reinforced with a heavy cloth insert. Inside the covering is the "frame" of 2" rubber tubing. Support and resiliency are provided by 15 to 25 inflated rubber bladders designed and manufactured by Dewey and Almy Chemical Company, Cambridge, Mass. These bladders, running cross-wise inside the rubber facing, are positioned between rubber spacers and are inflated by hand pump through protruding valves.

Thickness of door is only 2½" but high insulation value, important in cold storage plants and others, is provided.

Doors can be bent to as much as a 45° angle (see photo) and not only swing out freely but swing back smoothly to exact, normal position. Windows can be placed where desired in door panels.

(Inflatable rubber doors are the invention of Oliver C. Eckel and are built by Stic-Klip Mfg. Company, Dept. CP, 50 Regent St., Cambridge 40, Mass. . . . or for more information check CP 2621 on handy form, pages 2 and 3.)

Applies paint to concrete floors in 20" swath, ten times faster than usual . . .

tool is also adaptable for floor washing and cleaning or for applying liquid wax

Uses: For painting concrete floors. Tool has easy adjustment for floor washing and cleaning, and may be used to apply liquid wax.

Features: Operated with a 54" handle in "pushbroom" fashion, tool paints concrete floors ten times faster than with a 4" brush — and without stooping.

Description: "Jiffy" tool consists of a wedge-shaped rubber pad 20" long by 4½" wide. Paint is poured directly on the floor and spread evenly, filling floor indentations and cracks. Paints to wall edges without smearing. The double-edged tool is reversed in seconds to double its life, and is easily cleaned with a damp kerosene rag.

(Product of Mico Products Co., Dept. CP, 170 Gorham Ave., Hamden 14, Conn. . . . or for more information check CP 2622 on handy form, pages 2 and 3.)

Lab and field experience yield remedies to roof problems

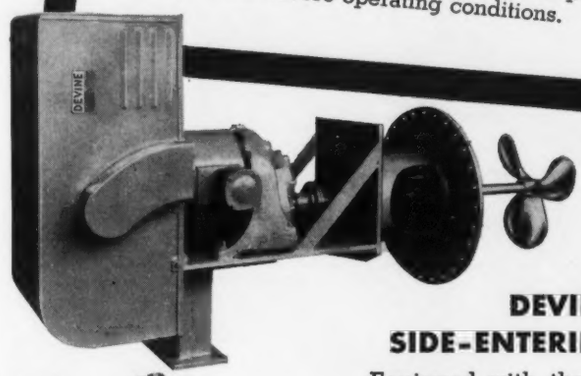
Roof maintenance brochure discusses solutions to roof problems in 32 pages. Description of various types of roofs and their construction features is supplemented with photographs, diagrams, and drawings. Booklet explores factors which enter into deterioration of roofs, and methods of diagnosing and treating roof failures. Information supplied is based on laboratory reports and field experience. Brochure is divided into 15 sections and provides table of contents for easy reference.

"Solving Roof Problems" is issued by The Tremco Manufacturing Company, Dept. CP, 8701 Kinsman Rd., Cleveland, Ohio. When inquiring specify CP 2623 on handy form, pages 2 and 3.

Devine Agitators

Built to Give Dependable Service on the Toughest Mixing Jobs

Designed with the idea of producing a better mixer—a mixer that would meet the most exacting requirements—Devine Agitators have that extra reserve of sturdiness that insures dependability under severe operating conditions.



DEVINE SIDE-ENTERING MIXER

Equipped with the exclusive self-sealing shaft that retains liquids in the vessel while stuffing box is repacked from the outside. Available with V-belt or gear drive.

DEVINE TOP-ENTERING MIXERS

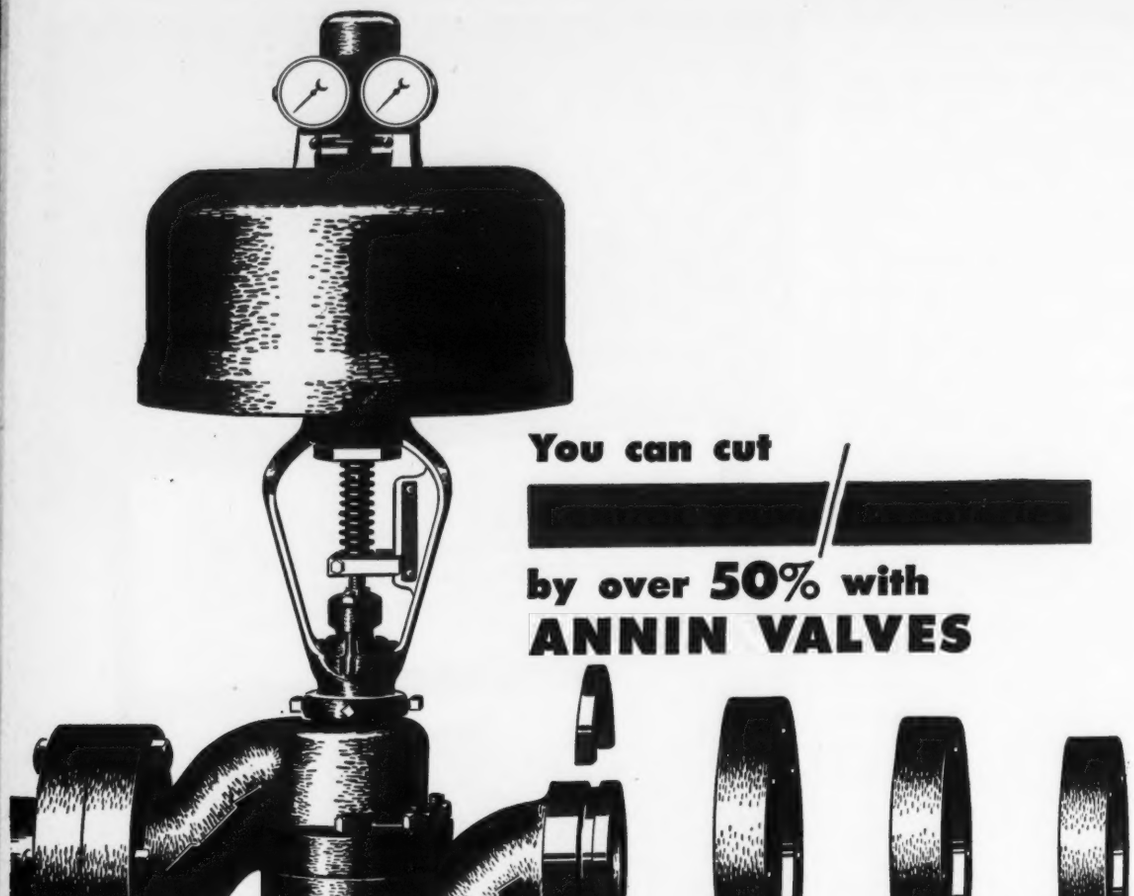
Portable, Flange-mounted, and Reduced-Speed, with geared or direct drive. Propellers ground, polished and dynamically balanced.

Describe the application to us and we will gladly recommend the type mixer best suited to your requirements.

J. P. DEVINE MFG. CO., INC.
49th STREET AND AVRR PITTSBURGH 1, PENNSYLVANIA

Devine
PROCESS EQUIPMENT

When inquiring check CP 2624 on handy form, pgs. 2-3



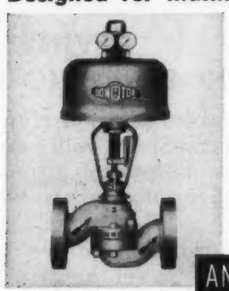
You can cut

[redacted]

by over 50% with

ANNIN VALVES

Designed for maximum interchangeability of valve bodies, flanges and operators



The Annin Domotor valves provide positive control of corrosive, erosive fluids and fluids containing semi-solids.

Because all Annin valve bodies carry 1000# ratings, interchangeable flanges in Series 15, 30 and 60 can be mounted with split-rings on any Annin valve body to meet the requirements of practically any installation. One body, mounted with proper flanges, can be used anywhere in the plant. In addition, any Annin operator—Domotor, Electro-Pneumatic, Handwheel—fits *two* sizes of any valve body. Thus it is unnecessary to stock spares for *every* valve type and size you use. Most Annin users report great reductions in necessary valve stocks from 50% to 75% and more!

This reduction in inventory, *plus* considerable reductions in maintenance costs make the Annin Valve one of the most economical to operate in your plant. It will pay you to investigate today the many advantages of Annin Control Valves. Send for Catalog 1500B.

Annin Catalog 1500B describes all Annin Valves, tells how Annins reduce inventories and cut maintenance costs. Send for your copy *today!*

[redacted]

When inquiring check CP 2625 on handy form, pgs. 2-3

CONSTRUCTION & MAINTENANCE

Reduces humidity in air conditioning without refrigeration . . .

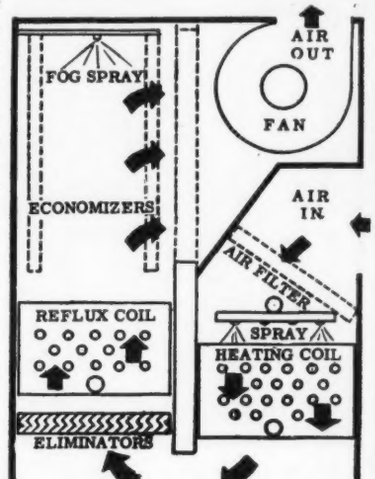
with special liquid drying agent, moisture is removed from systems constantly

Uses: For increasing performance of existing air conditioning systems. Can also be applied to processes and industries where materials are dried or protected from atmospheric moisture (foods, chemicals, textiles, metallurgical, electronic, and others).

Features: Concentrator method uses a drying agent to absorb moisture from air directly, reducing humidity without refrigeration. Allows air conditioning system to operate at full capacity by continuously removing moisture.

Description: Drying agent is a liquid (Hygrol) which has hygroscopic properties that afford control of the relative humidity of the area or process that is conditioned. As it is undiluted by the moisture it absorbs, a part of the liquid is pumped to the concentrator.

In the new method, (see illustration) diluted liquid is sprayed into an air stream over a heating surface which raises its temperature, evaporating the liquid water from it. The air stream then passes through eliminator plates which remove the liquid drops. In a second stage, it passes over a cooled reflux coil which raises the relative humidity in the chamber, condensing the absorbent vapor. In the third stage (the "economizers") it passes through filtration cylinders, each of which contains a fog nozzle. Here the building up of very high humidity completes the condensation of the absorbent liquid and its droplets are caught by the filters while the moisture-laden air passes through. The reconcentrated absorbent drains to the tank in the base from which it returns to the air conditioning unit, completing the cycle.



(Method is patented by the Niagara Blower Co., Dept. CP, 405 Lexington Ave., New York 17, N. Y. . . . or for more information check CP 2626 on handy form, pages 2 and 3.)

Air pressure activates mercury pump for acids . . .

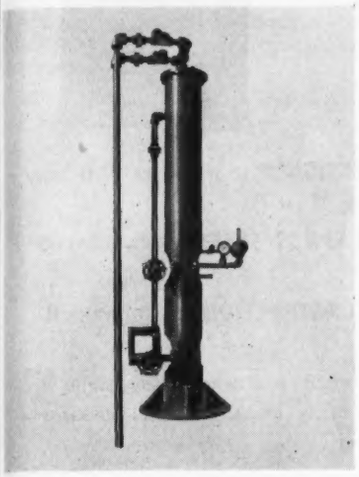
cuts maintenance problems with column of mercury as liquid mover at 3-30 gph

Uses: Pumps corrosive liquids with minimum number of moving parts in order to lower maintenance costs.

Features: Frequency of stroke is determined by air pressure supplied from single source. Steel float supported by column of mercury opens and closes vent port to at-

mosphere. Pressure alternation causes mercury to pump the liquid.

Description: Air pressure is applied to column of mercury supporting steel float. Acid enters intake valve as float and mercury descend to low level. Float is connected by rod to air vent, which opens as float descends. Air pressure is released to atmosphere and mercury rises to complete exhaust stroke. Air vent and valve assembly is located at top of pump and serves to trigger the discharge stroke.



Air powered mercury pump handles corrosive liquids

Outer mercury chamber is approximately 1½" in diameter and 22" long. Within this chamber is another mercury chamber 19" long, which serves as a guide for float. Overall height of pump is 30" and mercury used is 10 lb commercial grade. Air supply, intake, and exhaust valves are ¼" fittings and available in materials to meet specifications.

Pump is not intended for precision control, but deviations from fixed rate of flow can be corrected manually or pneumatically. Test run over eight hour period showed variation to be plus or minus 1% of set rate.

Air supply is controlled by 6000-B air pilot. Fixed air flow is set manually and pilot holds this rate regardless of head pressure as long as air supply is available and not over 100 lb. Pumping rates can be varied from 3 to 30 gph, by varying air flow to pump.

(Product of Instruments, Inc., Dept. CP, 122 N. Madison, Tulsa 6, Okla. . . . or for more information check CP 2627 on handy form, pages 2 and 3.)

Plastic pipe services suction, high-pressure, or general water transmission . . .

flexible pipe follows irregular contours and is resistant to electrolytic corrosion

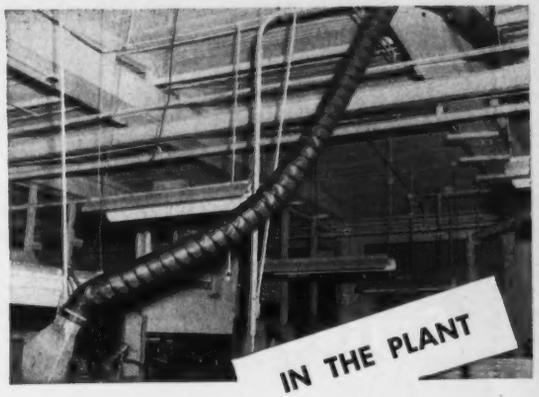
Uses: For water and high-vacuum installations such as natural gas transmission, disposal lines in strip and pit mines, sand and gravel pits, etc.

Features: Flexible, light-weight pipes are easily connected to either plastic or metal. Interior surface has absolute resistance to rot, rust, and electrolytic corrosion.

Description: Wall thickness is designed for protection against burst or collapse when handling high working pressures or operating in suction line. Type WS pipe is available in nine sizes ranging from ¾ to 6" nominal pipe size. Working pressure is 120 psi at 120°F in sizes up to 2", and slightly less in larger sizes. Smallest size (¾") weighs .216 lb/ft while 6" pipe weighs 5 lb/ft.

(Product of Carlon Products Corporation, Dept. CP, 10225 Meech Ave., Cleveland 5, Ohio . . . or for more information check CP 2628 on handy form, pages 2 and 3.)

Why move work around to get to present exhaust ducting?



Take SPIRATUBE® to the job!

With SPIRATUBE — the new type flexible ducting — you can set up production lines where you want them without expensive changes in your dust or fume removal system. SPIRATUBE connects quickly, easily to your present lines — and bends anywhere with minimum crimping. No turn is too short, no angle too acute. No elbows or special fittings to bother with in going around obstructions.

Best of all, YOU CAN INSTALL SPIRATUBE YOURSELF! That cuts down-time, keeps your production line going. The initial cost of Spiratube is small . . . and its life equals — sometimes exceeds — rigid ducts.

Standard sizes for all requirements are immediately available from well-stocked distributors — coast-to-coast!

For all ducting systems:

FLEXFLYTE® SPIRATUBE® AYRTUBE®

Flexible Tubing CORPORATION

Guilford, Connecticut Pasadena 1, California

FREE! Full details on this amazing, cost-saving ducting. Fill in coupon and mail

FLEXIBLE TUBING CORPORATION, Dept. CP-1, Guilford, Conn.

Please send me your new catalog on Flexible Tubing products.

My application is_____

Name_____ Title_____

Company_____

Address_____

City_____ State_____

When inquiring check CP 2629 on handy form, pgs. 2-3

GIVES YOU BEST

Performance

Because it's Best Suited to the Job

WELDCO Always Meets Your *Specifications*

TO GET TOP-QUALITY TUBING made to your individual needs, it's always good business to specify Weldco. For Weldco is produced by tubing specialists—men who have the equipment, facilities and experience to manufacture tubing to your exact specifications. Weldco is automatically machine-welded under pressure, properly formed, carefully finished, accurately sized and straightened, and rigidly checked.

Lightweight and corrosion-resistant, Weldco is available in Monel, Stainless, Inconel, Nickel and other alloys, in sizes from 3½" to 30" O. D., 16 ga. to ¼" wall thickness. To insure top performance and long service life, make Youngstown Welding your tubing headquarters. A letter or phone call puts our 36 years of specialized experience to work for you.

Whatever Your Needs In Tubing . . . You're Way Ahead With WELDCO

THE YOUNGSTOWN WELDING & ENGINEERING CO.
3712 OAKWOOD AVE. · YOUNGSTOWN 9, OHIO

When inquiring check CP 2630 on handy form, pgs. 2-3

CONSTRUCTION

Packing is designed for service from 500 to 6000 psi . . .

either of asbestos cloth or cotton duck and neoprene

Uses: No. 2005 is recommended for high-temperature service on reciprocating steam or air rods, hot oil pumps, etc. No. 2008 is indicated for hydraulic rams, outside packed plunger pumps, etc, handling oil or water.

Features: Sells for about half the usual price of V-type packing in ring sets and is available for immediate delivery.

Description: Known as Continuous-Vee packing, it is furnished in sizes from ¼ to 1", by 1/16" increments, 25' per spiral. Packing size is only dimension that need be given when ordering, as user cuts his own rings on the job to fit specific rod and stuffing box dimensions.

Designed for service between 500 and 6000 psi, Continuous-Vee is available in the previously mentioned styles: No. 2005 of asbestos cloth and neoprene, and No. 2008 of cotton cloth and neoprene.

(Manufactured by Mechanical Packing Division, Flexrock Co., Dept. CP, 3670-B Cuthbert St., Philadelphia 4, Pa. . . . or for more information check CP 2631 on handy form, pgs. 2 & 3.)

Seal retains lubricant in improved unit pillow block . . .

a collar with set screws makes for easy installation

Uses: Designed for use in conveying machinery; light fans and blowers; light power take-off units, and jack shafts, among others.

Features: Practically frictionless wiping action of seal against inner bearing ring; a collar with set screws for easy installation.

Description: Hess-Bright SY improved unit pillow block has a lubricant-retaining DuPont Fairprene red seal. Rotating flingers exclude dirt, and unit is easily interchangeable with existing installations.

Costly machining is eliminated in installation, with consequent reduction in maintenance costs. Shaft diameters range from 1 3/16 to 2 15/16".

(A product of SKF Industries, Inc., Dept. CP, P. O. Box 6731, Philadelphia 32, Pa. . . . or for more information check CP 2632 on handy form, pages 2 and 3.)

Naturally the Best!

MARLEY Natural Draft Cooling Towers

● **MARLEY DESIGNED** to minimize drift but to take advantage of air flow!

● **BALANCED SPRAY SYSTEM** with patented Marley nozzles!

● **RUGGED CONSTRUCTION** of heart redwood lumber.

● **DELIVERY** when and where you want it from stocks in many cities. Prefabricated for easy field assembly.

Call your local Marley Representative

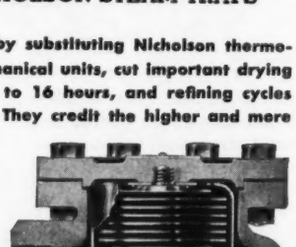
MARLEY *The Marley Company Inc.*
Kansas City 5, Missouri

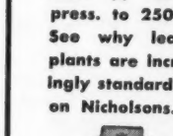
When inquiring check CP 2633 on handy form, pgs. 2-3

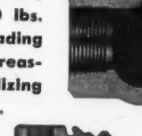
CUT DRYING CYCLE from 24 to 16 HOURS

WITH NICHOLSON STEAM TRAPS

A large processor, by substituting Nicholson thermostatic traps for mechanical units, cut important drying operations from 24 to 16 hours, and refining cycles from 5 to 4 hours. They credit the higher and more even temperatures Nicholson traps effect. 5 types for every purpose; sizes ¼" to 2"; press. to 250 lbs. See why leading plants are increasingly standardizing on Nicholsons.







BULLETIN 152

181 Oregon St.
Wilkes-Barre, Pa.

W. H. NICHOLSON & CO.

TRAPS · VALVES · FLOATS

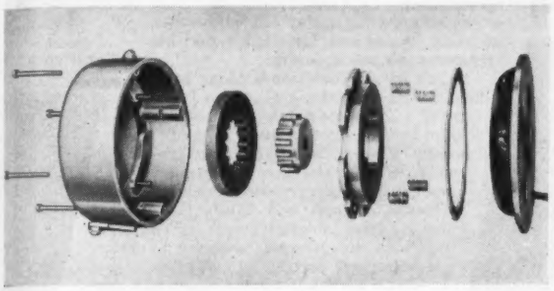
When inquiring check CP 2634 on handy form, pgs. 2-3

Magnetic brake eliminates levers and permits use of both ends of output shaft . . .

brake contains only 6 major operating parts and lining wear is adjusted by spring

Uses: On conveyors, cranes, automatic machines and other types of equipment requiring intermittent stop and start powering.

Features: Magnetic brake design eliminates all levers and linkage found in conventional models. Contains only six major operating parts and incorporates automatic set



Doughnut design of 6 part brake permits shaft to extend thru brake

and release action between solenoid and armature. Motor's output shaft extends thru the brake; thus both ends of shaft may be used for powering two pieces of equipment. Lining wear is automatically compensated for by spring tension.

Description: Brake sets by spring action when current is off and releases magnetically when current is re-applied. Manual release permits rotation of output shaft by hand when current is off. Brake resets when current is applied. Removal of four machine screws releases housing to expose all parts. Brakes are available in 3, 10, and 25 ft lb continuous duty ratings. Intermittent duty units are offered in 15 and 35 ft lb ratings.

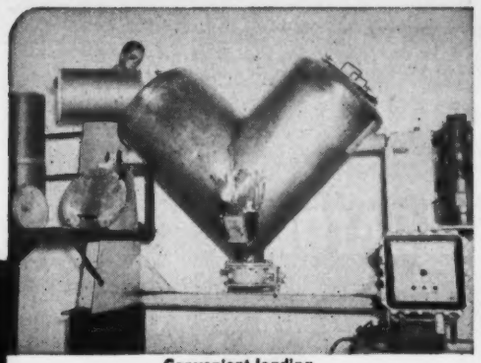
Models are light weight with OD of 8 3/16" and ID of 6½". Continuous duty units have 3" depth while intermittent type brakes have 4" depth. Brakes may be mounted by means of regular Reuland mounting methods or to NEMA "C" face type endbells.

(Reuland Magnetic Brake is product of Reuland Electric Co., Dept. CP, Alhambra, California . . . or for more information check CP 2635 on handy form, pages 2 and 3.)

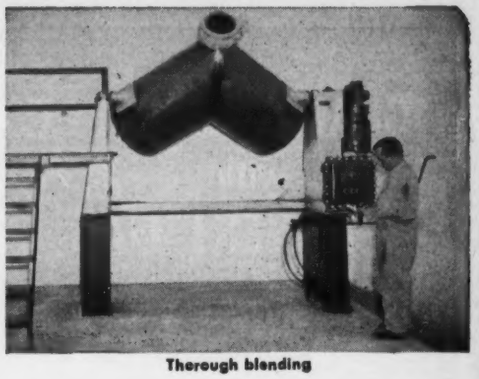
Show repair and maintenance of centrifugal pumps

Two catalogs discuss installation, repair, and operational features of single stage, single suction and multi-stage centrifugal pumps. One publication supplies pertinent information regarding bearing lubrication, stuffing boxes, approved lubricants, and a maintenance timetable for periodic check-ups. Trouble spots are summarized in brief table and remedies suggested. Cutaway illustrations permit view as well as description of pump parts.

Second publication offers similar outline of maintenance and repair procedures, but its attention is devoted exclusively to multi-stage centrifugal pumps. Breakdown diagrams of couplings emphasize operational features. Sectional views and descriptive material cover dismantling and assembling of pumps. Cat 08X7780 and Cat 08X7813 are issued by Allis-Chalmers Manufacturing Company, Dept. CP, 1151 S. 70th St., Milwaukee 1, Wis. When inquiring specify CP 2636 on handy form, pages 2 and 3.

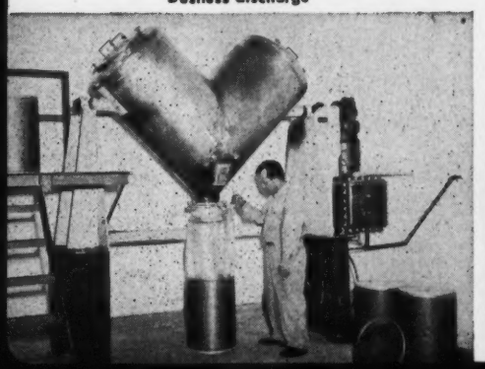


Convenient loading



Thorough blending

Dustless discharge



Easy cleaning

SAVES TIME PROMOTES UNIFORMITY for GANE'S chemicals

When executives of Gane's Chemical Works, Inc., Carlstadt, N. J., witnessed a laboratory test of the p-k Twin Shell Dry Blender, they were immediately impressed by its possibilities. Now—a 20-cu. ft. stainless steel blender is in constant operation, blending phenobarbital and similar drugs where no variation in lot batches can be tolerated. The p-k Twin Shell requires an average of only 10 to 15 minutes for a complete blend to absolute uniformity as compared with from 4 to 5 hours previously required in other blending equipment, without guarantee of uniformity.

Loading and discharging time has been reduced—cleaning is simplified by the smooth polished interior surface and absence of baffles in the p-k Blender. p-k Twin Shell Blenders mix dry materials faster and more uniformly than any other blender. Operating capacities range from 1 to 250 cubic feet; speeds from 6 to 29 rpm.

p-k will be glad to run an experimental blend of your materials to demonstrate timing for thorough blending. There is no obligation—and the results will introduce you to an entirely new and widely accepted method of dry blending.

Send for Catalogs 401 and 402 for further information on both the laboratory and production models.

Mixers • Coolers • Kettles • Agitators
Nitrators • Reboilers • Autoclaves
Condensers • Evaporators • Sulfonators
Brine Heaters • Brine Coolers
Freon Coolers • Soap Crutchers
Ribbon Blenders • Fuel Oil Heaters
Vapor Condensers • Lube Oil Coolers • Lube Oil Heaters • Reaction Vessels • Instantaneous Heaters
Quenching Oil Coolers • Storage Heaters
Refrigerant Condensers • Twin Shell Blenders*
*Patented

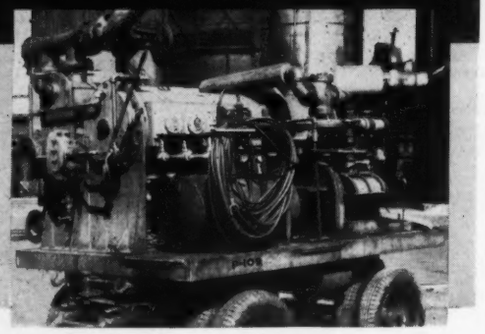
the Patterson-Kelley Co., Inc.
30 Lackawanna Ave. East Stroudsburg, Penna.

1011

101 Park Avenue, New York 17 • Railway Exchange Building, Chicago 4 • 1700 Walnut Street, Philadelphia 3 • 96-A Huntington Avenue, Boston 16

When inquiring check CP 2637 on handy form, pgs. 2-3

GUARD AGAINST EXPLOSION with R·C INERT GAS GENERATORS



Portable R-C Inert Gas Generator used for purging operations and stand-by protection in large gas-producing plant. Capacity 15,000 cfh.

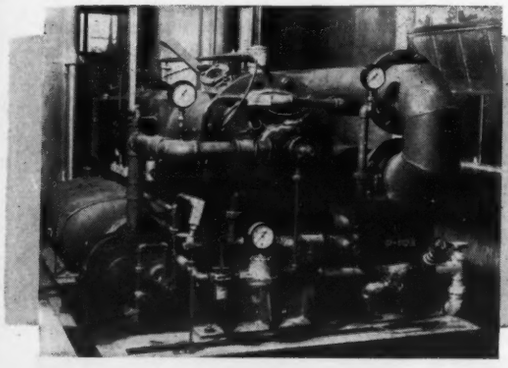
If your operations involve materials or processes which might cause an explosion-produced fire, you can reduce the risk with R-C Inert Gas Generators. In many instances, the relatively small cost is absorbed by savings in insurance costs.

These mobile or stationary units instantly produce a continuing flow of inert gas, for use in purging gas or liquid lines, blanketing dangerous areas and for many other industrial uses involving the handling or storage of explosive materials.

R-C Inert Gas Generators are compact, simple and inexpensive to operate, with either oil or gas as fuel. They are available in capacities from 1,000 cfh to 50,000 cfh, with characteristics to match specific requirements.

Where even a relatively low explosion hazard exists, one incident might produce a disastrous fire. Ask for details on how such dangers may be averted with R-C Inert Gas Generators.

ROOTS-CONNERSVILLE BLOWER CORPORATION
526 Richland Avenue, Connersville, Indiana



Installation of three R-C Inert Gas Generators similar to this one helped one large plant save $6,000 per month insurance premiums, as well as substantially reduce danger of production losses caused by explosion or fires. Capacity of each unit, 6,000 cfh.

Reg. U. S. Pat. Off.

ROOTS-CONNERSVILLE BLOWER BUILDERS SINCE 1854

ONE OF THE DRESSER INDUSTRIES

When inquiring check CP 2638 on handy form, pgs. 2-3

CONSTRUCTION

Resist very high temps without blistering, peeling, etc . . .

titanium paint up to 2840°F and chrome product to 4000°F

Uses: Boiler combustion chambers, electric furnaces, ovens, internal combustion engine exhaust pipes, high-temp steam lines, kilns, air heaters.

Features: Thin — 1/64" thick — coat of products will expand and contract as part of the basic material without peeling, blistering, bloating or checkering, even under rapid temperature changes.

Description: White Hot, which withstands temperatures up to 2840°F, contains titanium. Pyro-Chrome, grass green in color, is for heavy duty use — temperatures up to 4000°F. Its chief ingredient is chrome. Both are of the consistency of thick paint and may be applied with brush, spray, or by dipping. They spread easily, adhere firmly.

Put on at normal room temperature, a coat dries in 1 to 6 hr, depending on material covered, humidity, and temperature. One gal of either product will give 200 to 400 sq ft of coverage, depending on whether surface is porous or smooth.

(Manufactured by Preferred Utilities Manufacturing Corp., Dept. CP, 1860 Broadway, New York 23, N. Y. . . . or for more information check CP 2639 on handy form, pages 2 and 3.)

Has better toughness and mar resistance than lacquer . . .

synthetic also effects greater coverage per gallon

Uses: Lacquer substitute.

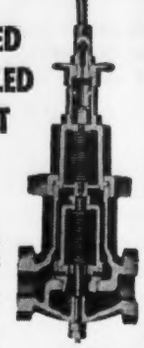
Features: Greater coverage than lacquer; also, better mar resistance, toughness and cold check resistance.

Description: Clear synthetic finish, BO 535, requires baking at 150°F for 1½ hr, 140°F for 2 hr, or 120°F overnight. It offers varying degrees of resistance and suffers no loss of gloss when subjected to: boiling and cold water, boiling soap solution, and an alcohol-water mixture.

For best results BO 535 should be applied on a coating of manufacturer's S 4077 sanding sealer, which may be sanded within 1 hr.

(Product of United Lacquer Mfg. Corp., Dept. CP, 1001 W. Elizabeth Ave., Linden, N. J. . . . or for more information check CP 2640 on handy form, pages 2 and 3.)

SELF -CONTAINED -CONTROLLED -SUFFICIENT -RELIANT



Stacon Temperature Regulator*

The patented Farris Stacon Temperature Regulator is easily the most independent regulator available today. It's unique. It stands alone. It's trustworthy. It needs no watching. It's perfect for the man who wants no cause for worry . . . who wants to relax in the sure knowledge that his temperatures are constant.

Here's why Stacon stands alone in the field. It has no packing glands to leak or bind . . . the stem moves freely. The liquid in the bulb flashes to vapor in the power bellows, assuring hairtrigger response to move the disc. It operates with unbelievable accuracy—to within plus or minus 1 degree—and it operates with that accuracy under *all* conditions. Stacon provides air-operated accuracy at low, self-operated cost.

Get the details on the one truly outstanding temperature regulator—Stacon. Send for Bulletin 50-1000 to get all the details.

*Patented and Patents Pending

Farris Stacon Corporation
206 COMMERCIAL AVE. PALISADES PARK, N. J.

When inquiring check CP 2641 on handy form, pgs. 2-3

The Portable MORSE ROTATOR

THE NEWEST ADDITION TO 25 YEARS OF SUCCESSFUL MANUFACTURING EXPERIENCE

SAVES TIME! SAVES LABOR! MODEL 500

SAFELY ROTATES UP TO 500 LBS. AT 10, 20 OR 40 RPM

A powerful, compact motorized unit that will cut costs of mixing, tumbling, cleaning, etc. Scientifically engineered for smooth, safe revolving. Can be loaded by ONE MAN and is easily moved. The power drive has a ¾" dia. shaft and is equipped with self-aligning bearings. Four 4" dia. Neoprene drive wheels adjustable to take from 1 to 55 gal. cylindrical containers. Wt. before crating 137 lbs. Furnished with motor and gear reduction unit. *Write For Complete Information.*

MORSE MANUFACTURING CO., INC.
124 Dickerson Street Syracuse 2, N. Y.

When inquiring check CP 2642 on handy form, pgs. 2-3

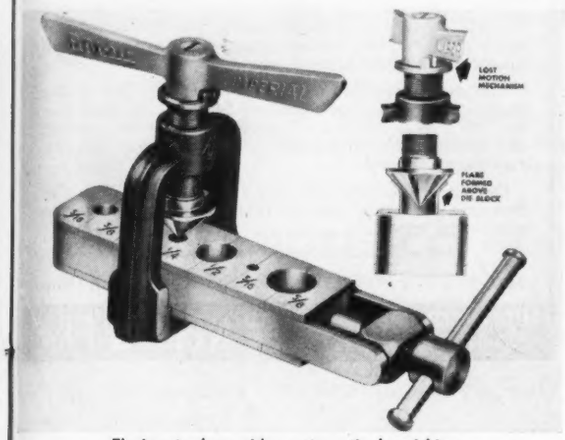
Flanges on tubing are easily made when using simple tool for flaring . . .

faceted cone furnishes burnishes with fine finish to flares automatically

Uses: For forming flared fitting joints on small tubing of copper, steel, aluminum, and brass.

Features: Provides automatic burnishing on face of flare without scoring tubing.

Description: Tool makes 45° flares on six sizes of tubing - 3/16, ¼, 5/16, ⅜, ½, and ⅝" OD for standard SAE flared fitting joints. Cone is made of hardened steel and is of a multi-faced type, with a tool chrome finish.



Flaring tool provides automatic burnishing

Steel flaring bar is of the sliding segment type and has a single screw at the end with rod handle for leverage, which provides quick tightening. Yoke is made of forged steel.

Automatic burnishing action is provided through use of mechanism in the yoke which disengages the feed during the first revolution when backing off the cone, causing it to burnish the flare. Flare is formed above the flaring bar to assure that original wall thickness of the tubing is maintained at the base of the flare, manufacturer reports.

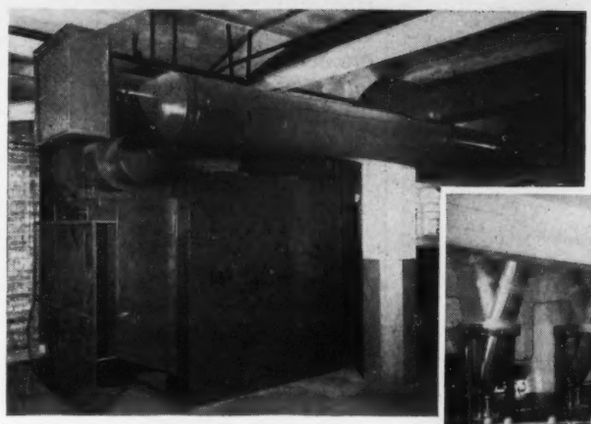
(Development of The Imperial Brass Mfg. Co., Dept. CP, 1200 W. Harrison St., Chicago 7, Ill. . . . or for more information check CP 2643 on handy form, pages 2 & 3.)

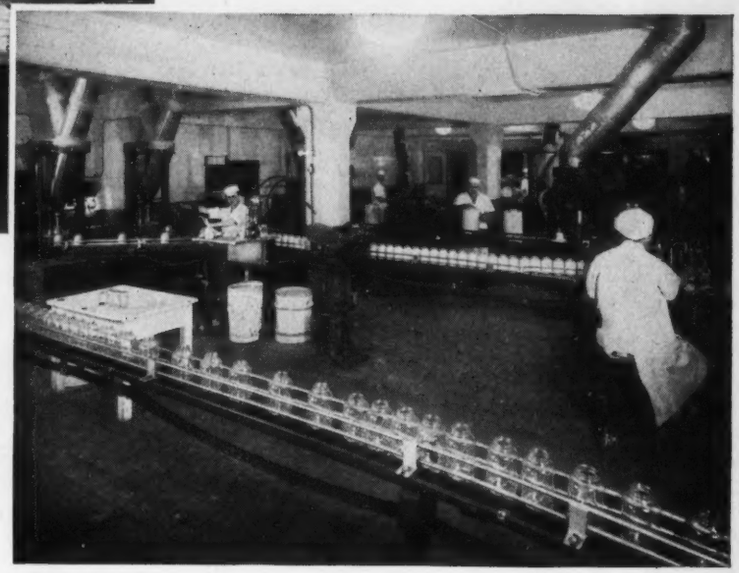
Versatile machine scrubs, polishes, waxes, buffs, sands, grinds . . .

thumb-screw adjustment changes handle position to suit individual operator for height

With a series of interchangeable attachments, manufacturer's floor machine may be used to scrub, wax, polish, buff, sand, grind, or steel-wool floors of all kinds. These self-propelling machines may also be used to shampoo tacked-down carpeting without removing it from the floor. By setting a thumb-screw, handle on four of the six models offered can be adjusted for most comfortable operating position to suit tall or short operators. Brush spreads range from 11 to 19 inches. Models are available with or without solution storage tank mounted on the handle for use with patented shower-feed brush.

(Product of the Hild Floor Machine Company, Dept. CP, 740 W. Washington Blvd., Chicago 6, Ill. . . . or for more information check CP 2644 on handy form, pages 2 and 3.





The Lectrodryer holds this filling room below 50% relative humidity, so the malted milk powder is kept DRY.

When you say,

"Make mine a Horlick's malted..."

Horlick's malted milk powder flows freely from the dispenser, because it was packaged in a DRY atmosphere. Regardless of outside weather conditions in Racine, Wisconsin—any day in the year—this filling room has "winter-weather DRYness". A Lectrodryer* keeps it that way.

Supply DRY air to processing equipment, workrooms and storage areas and you speed production, while also preserving product quality. That's the experience of thousands of plants all over the world, in dozens of industries. Lectrodryers do that DRYing.

The book, "Because Moisture Isn't Pink" describing many of these installations, may be your key to ways of increasing your production. For a free copy, write Pittsburgh Lectrodryer Corporation, 352 32nd Street, Pittsburgh 30, Pennsylvania. Ask for Bulletin 216.

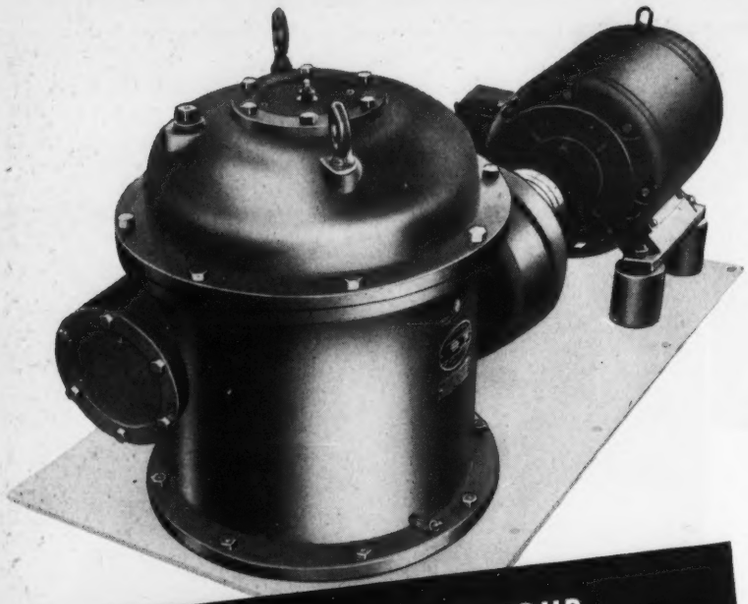
In England: Birlec, Limited, Tyburn Road, Erdington, Birmingham.
In Australia: Birlec, Limited, 51 Parramatta Road, Globe, Sydney.
In France: Stein et Roubaix, 24 Rue Erlanger, Paris XVI.
In Belgium: S. A. Belge Stein et Roubaix, 320 Rue du Moulin, Bressoux-Liege.

LECTRODRYERS DRY WITH ACTIVATED ALUMINAS

LECTRODRYER

*REGISTERED TRADEMARK U.S. PAT. OFF.

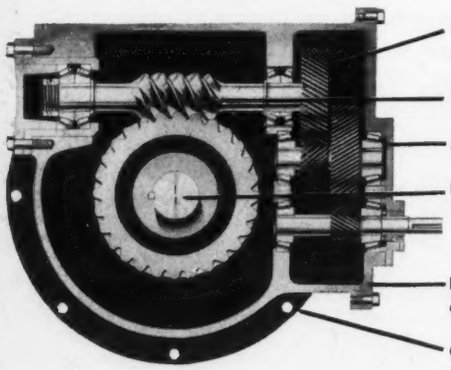
When inquiring check CP 2645 on handy form, pgs. 2-3



SIMPLE DESIGN CUTS YOUR AGITATION COSTS

● Look into a Nettco Agitator Drive and you'll see why it serves you so faithfully and economically. Here's complete simplification of design — fewer parts to wear, fewer parts to maintain, fewer parts to replace.

Nettco — in its fiftieth year — offers you a wide choice of agitating equipment, all designed for durable, dependable service. The Nettco line is backed by a fund of agitating experience unequalled anywhere. Follow the example of many of the nation's leading process companies . . . make Nettco your source for ENGINEERED agitating equipment. Write, giving details on your process requirements. New England Tank & Tower Co., 93 Tileston Street, Everett 49, Mass.



- Hardened alloy steel helical reduction gearing.
- Heavy-duty worm and gear drive.
- Anti-friction bearings throughout.
- High strength, alloy steel vertical shaft for deflection-free operation.
- Fully enclosed housing — proof against dust, fumes, moisture.
- Compact design — saves tank top space — requires minimum head room.

NETTCO

Foremost in ENGINEERED AGITATION for over half a century

When inquiring check CP 2646 on handy form, pgs. 2-3

CONSTRUCTION

Diamond-tipped cutter aids in marking hard steel . . .

makes marks as deep as .005"

Uses: For marking hardened and ground machine tool parts and dies.

Features: Sharp pointed Panto cutters made with diamonds faceted edges makes a very clear mark to a depth of .005", depending upon the material and degree of hardness. Process has evolved from adapting diamond cutters to use in engraving, routing, electric marking, and acid etching machines.

Capable of marking hardened tool parts and dies

Description: Furnished in straight and tapered shank styles, cutters can be used in any engraving or routing machine adaptable to these types. The pantograph type of machine which follows master copy type insures readable and attractive mark. Objections to acid etching, sand blasting or electric marking are overcome by this method, manufacturer reports.

(Product of H. P. Preis Engraving Machine Company, Dept. CP, 69 Industrial Branch, Hillside, N. J. . . . or for more information check CP 2647 on handy form, pages 2 & 3.)

Sieve-like material is a good base for roof coating . . .

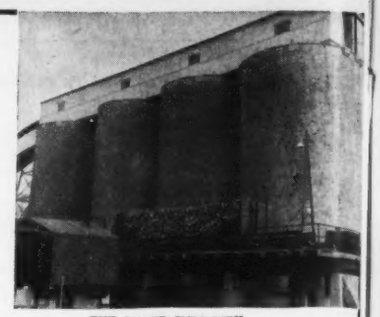
immunity to rot feature of fireproof fiber glass threads

Uses: With roof coating compounds in repairing roofs, stopping roof leaks and waterproofing areas around flashings, firewalls, chimneys and skylights.

Features: Impervious to rot, decay.

Description: Known as No-Rot, the membrane is composed of fireproof fiber glass threads. It provides a good base for roof coating because

87 varieties • stored in N & F silos



THE PAPER INDUSTRY

The photo shows four 30 x 60 ft. Neff & Fry silos used for storing wood chip at a pulp and paper plant. Each holds 30,000 cu. ft. of chips, enough to make 80 tons of pulp, which is 16% of the daily run.

Wood chips are one of the 87 kinds of flowable bulk materials handled in Neff & Fry Storage Bins. The list includes ashes, cement, clay, coal, grain, gravel, lime, nuts, ore, rock, sand, seed.

The distinctive feature of a Neff & Fry Bin is the diagonal-ended Super-Concrete Stave . . . formed under 140 tons pressure . . . . virtually as dense, strong, and enduring as natural stone. The stave does not rot, rust, burn, or spall.

Get the whole story in our folder, "Bins With the Strength of Pillars." Ask for it now while you have the subject in mind.

Not exported except to Canada and Mexico

THE NEFF & FRY CO. • 166 Elm St., Camden, Ohio

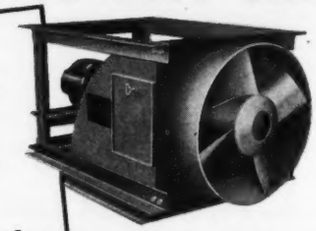
SUPER-CONCRETE STAVE STORAGE BINS — NEFF & FRY

When inquiring check CP 2648 on handy form, pgs. 2-3

Wing

ELBOW TYPE DUCT FANS

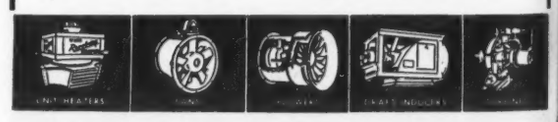
Delivers Large Air Volumes with Low Power Consumption



Complete range of sizes from 10 in. to 60 in.; and from 200 to 85,000 c.f.m.

The Wingfoil Axial Flow Duct Fan, in either elbow type or straight line type, is a compact, economical fan designed to operate against static pressure. The elbow type replaces an elbow in a run of duct, with the motor outside the housing, unaffected by hot or dirty air or gases. Belt or direct drive. Wingfoil "Non-overloading" fan wheel characteristics. Write for bulletin.

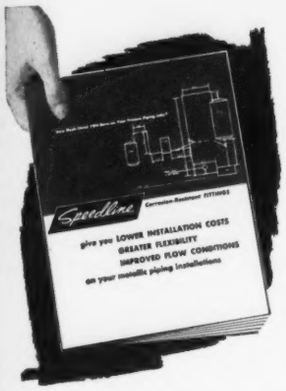
L. J. Wing Mfg. Co. 179 Vreeland Mills Road Linden, New Jersey



When inquiring check CP 2649 on handy form, pgs. 2-3

NEW Corrosion-Resistant

Speedline fittings



LOWER PIPING COSTS result when you use *Speedline* fittings, because you can use lightweight Schedule 5 pipe. Increased ID of Schedule 5 pipe gives lines increased capacity.

RAPID INSTALLATION is possible because the *Speedline* method often eliminates the need for welding or flaring.

Write for your copy of this 20-page *Speedline* catalog. It gives you the entire story.

HORACE T. POTTS CO. *Since 1815*

Erie Avenue & D Street, Philadelphia 34, Pa.

Baltimore Branch Warehouse, 2835 Sisson Street

When inquiring check CP 2650 on handy form, pgs. 2-3

Nerco-Niro

Spray Dryers

For maximum solids recovery. Adaptable to a wide range of chemicals. Easy and economical to operate and maintain. Performance backed by years of spray dryer experience. Each industrial installation individually engineered. *Laboratory facilities available for test purposes.*

Illustrated: Portable 34" Nerco-Niro Spray Dryer unit.

NERCO NIRO

NICHOLS ENGINEERING & RESEARCH CORP.

NERCO-NIRO SPRAY DRYER DIVISION

70 Pine Street, New York 5, N. Y.

INDIANAPOLIS PASADENA MONTREAL

When inquiring check CP 2651 on handy form, pgs. 2-3

CONSTRUCTION

of its sieve-like mesh which enables the coating to bind to the surface below as well as to the membrane itself.

It is extremely flexible and, unlike conventional membrane, can be fitted snugly around corrugated surfaces, pipes, and into sharp corners to form a tight, waterproof seal.

(Product of The Monroe Co., Inc., Dept. CP, 10703 Quebec Ave., Cleveland 6, Ohio . . . or for more information check CP 2652 on handy form, pages 2 and 3.)

Automatic tension is feature of coil winder . . .

adjustments can be made easily without removing head

Uses: Three-phase head winds mush-type coils for motors ranging from ¼ to 75 hp. Coils can range from 2¼ by 5" to 11½ by 19½".

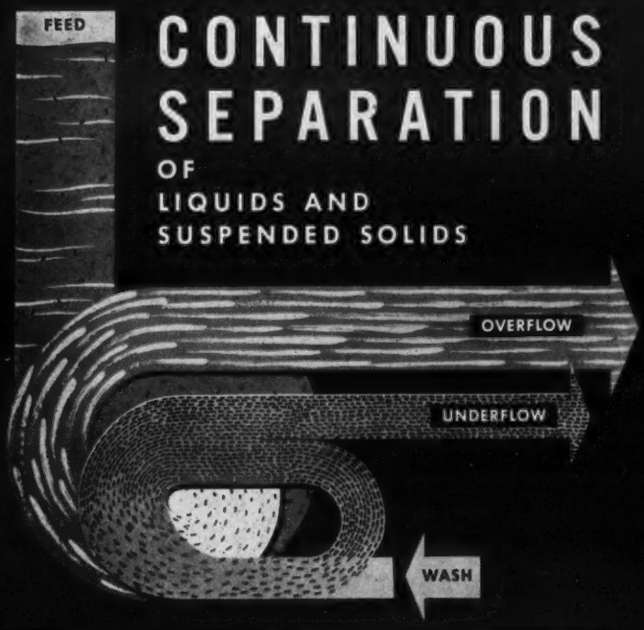
Features: Automatic tension device holds arms rigid while winding. When coil is finished, tension is released by pulling arms out and turning inward, permitting coil removal. Four permanently attached cranks permit easy

Speeds up coil winding

head adjustment without detaching. Wire guide enables operator to guide wire into proper place and insures uniform coils, utilizing maximum speed.

Description: Coil winder heads may be mounted on face plate of all heads or other turning devices. A complete set of coils can be wound with one wire without need for soldering coils in series. Wires in each coil are parallel, wound to correct shapes, ready for insertion in motor or other equipment without reshaping.

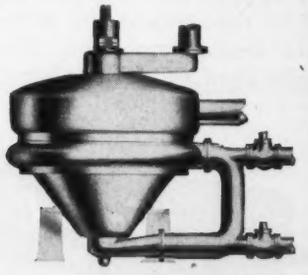
(Three-phase winding head is development of Crown Industrial Products Co., Dept. CP, Park and Borden Ave., Sycamore, Ill. . . . or for more information check CP 2653 on handy form, pages 2 and 3.)



The Merco Separator brings the modern, **continuous** flowplan to new phases of the chemical industry. It replaces bulky, batch-type operations, eliminating inherent slowness, contamination and fluctuations.

Versatile Merco Separators are economical replacements for conventional settling tanks, filters and centrifuges. In addition, Mercos handle micro-classification and washing of extremely fine particles—functions that cannot be economically duplicated by other means.

Merco continuous separation is based on a unique return flow principle. Clarified liquids and concentrated solids are separated and discharged without clogging, buildups, surges or retention of material. The action is entirely enclosed. All controls are external and simple.



MERCO

Write today for descriptive bulletin C19 and application data.

MERCO CENTRIFUGAL CO.

AFFILIATE OF THE MERRILL COMPANY, ENGINEERS

150 GREEN STREET • SAN FRANCISCO • CALIFORNIA

When inquiring check CP 2654 on handy form, pgs. 2-3

ROTARY UNIONS

(Trade Name)

TYPE "FSG" ROTARY UNION
(Flange syphon type with all-graphite bearing construction)

A REVOLVING STEAM CONNECTION

Pipe sizes ¼" through 3"

Never touched them ... in over three years

That's what the superintendent of a large mill recently wrote about his ROTARY UNIONS. The same story has been oft repeated by others who use ROTARY UNIONS on rubber and plastics extrusion equipment, flake rolls, grain dryers, pigment grinders, calenders, printing and coating machines, and other revolving equipment. This extraordinarily long service is due to the unique construction of ROTARY UNIONS, which relieves stress and strain on moving and sealing parts.

Over 40 standard sizes and styles of ROTARY UNIONS take care of all ordinary applications, such as Steam up to 150 PSI, Hot Oil to 500° F, Coolants, Air, Gases, Water, Brine, Vacuum, and Alternate Mixtures at speeds up to 1000 RPM. Our own direct sales engineers will be glad to recommend the proper unit or to discuss your special sealing problems. Please call our nearest office, or write Dept. 5C for our latest catalog.

"Where *Good Connections* Count" ®

PERFECTING SERVICE COMPANY

332 Atando Avenue (Home Office and Factory) Charlotte, N.C.

Offices in Chicago, Cleveland, Philadelphia, Providence, New York, Montreal, Toronto

When inquiring check CP 2655 on handy form, pgs. 2-3

CONSTRUCTION

Develop alloy for corrosive and hi-temp use . . .

high resistance to cracking under drastic temp changes

Uses: Incoloy is essentially a companion product to manufacturer's Inconel and is designed for similar purposes served by latter — generally, conditions of high temperature and corrosion. On basis of data obtained to date, it is expected that in high temperature environments, Incoloy will have high resistance to attack by sulfidation, green-rot, and molten cyanide salts and will be comparable to Inconel in resistance to oxidation.

Features: Shows no tendency to become embrittled after prolonged exposure to intermediate temperatures. Should have high resistance to cracking under drastic temperature changes.

Description: Incoloy contains approximately 34% Ni, 21% Cr and the balance Fe. (Inconel: 77% Ni, 15% Cr and balance Fe.) It is produced in most standard rolling mill forms, including sheet, strip, rod, wire and tube.

At room temperatures its tensile properties and hardness in the annealed condition fall within the nominal range of tensile properties and hardness for annealed Inconel. Rates of work hardening of the two are practically identical. It can be welded by standard methods, including metal arc and inert gas.

While Incoloy exhibits many of the properties of Inconel, it is not expected to compete with the latter in normal times for many uses.

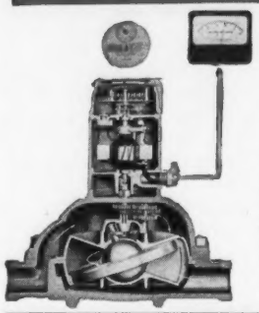
(A development of The International Nickel Co., Inc., Dept. CP, 67 Wall St., New York 5, N. Y. . . . or for more information check CP 2656 on handy form, pages 2 and 3.)

Here's how to select speed reducers

Detailed information on how to select double reduction gearing, examples of selection, dimension sheets, horsepower rating tables, and complete physical data are included in 48-page, illustrated bulletin describing manufacturer's double worm and helical-worm gear speed reducers. Complete data is included on horsepower, output torque, and center distances for reductions up to 6400:1.

Bul G-WWH is issued by the De Laval Steam Turbine Co., Dept. CP, Trenton 2, N. J. When inquiring specify CP 2657 on handy form, pages 2 and 3.

Remote indication and control of liquid flow



Hays VERIFLOW meter accurately measures, indicates, and totals the flow of corrosive and hard-to-meter liquids without using weigh tanks, orifice plates, or gage sticks.
With the Hays VERITROL you simply set a knob at the rate of flow desired . . . then, the VERITROL *controls* the flow of liquid at that set-rate.

for corrosive liquids

Acetic Acid, Aluminum Potassium Sulphate, Ammonia, Calcium Compounds, Carbolic Acid, Formaldehyde, Fruit and Vegetable Juices, Hydrogen Peroxide, Phosphoric Acid, Potassium Hydroxide, Sodium Compounds, Sulphuric Acid (concentrated), Stearic Acid, and many others

Send for a complete description of Hays Veriflow Meter and Veritrol. Bulletin 48-766

THE HAYS CORPORATION

MICHIGAN CITY 12, INDIANA

When inquiring check CP 2658 on handy form, pgs. 2-3

FAST-HEATING, VERSATILE TEMCO HOT PLATES...

NEW DESIGN... for evaporations, boiling and general controlled heating

Latest engineering advances embodied in this TEMCO design lets you perform your work more efficiently, gives you extra economy of operation. Cast aluminum top plate heats to 500°F. in 30 minutes. Temperature range 140°F. to 850°F. Built-in Temcometer provides precise temperature control. Clean-cut modern stainless steel body is resistant to chemicals, easy to keep clean. Controls especially ventilated for cool operation and control panel recessed for protection against damage. Two compact sizes: 12" x 12" and 12" x 24", both 7" high Write for bulletin H-1 and dealer's name.

THERMO ELECTRIC MANUFACTURING CO.

476 Huff St., Dubuque, Iowa.

When inquiring check CP 2659 on handy form, pgs. 2-3

Easy installation is feature of valve designed for relieving pressures . . .

safety valve has greater relieving capacity in Btu than particular boiler generates

Uses: For use on hot water space heating boilers, tanks and heaters.

Features: Easily installed, safety relief valve has greater relieving capacity in Btu per hr than the particular boiler for which it is designed can generate. Valve also has sufficient capacity to relieve pressure due to thermal expansion of water, as well as that of steam caused by failure of the firing device to shut off.

Description: Approved by the National Board of Vessel Inspectors and the ASME, Type F-51 safety relief valve is of all-bronze, incorporating an exceptionally high lift design, a stainless steel spring, and silicone seat disc. Is available in pressure settings from 30 to 125 psi.

(Developed by the A. W. Cash Valve Mfg. Corp., Dept. CP, Wabash and Morgan, Decatur, Ill. . . . or for more information check CP 2660 on handy form, pages 2 & 3.)

Protects thermal insulation from weathering, abrasion, air infiltration . . .

fire resistant protective coating is reported to substantially lengthen insulation service life

Uses: Tough, fire resistant, protective coating for thermal insulation — block, blanket, plastic, etc. Being used for protecting insulated oil refinery stills and towers, outdoor heaters and tanks, ducts, breechings, steam lines, and exposed types of equipment. Serviceable temperature limit is 450°F.

Features: Protects insulation from weathering, fumes, and abrasion, and seals against air infiltration. Service life of the insulation is reported to be substantially lengthened.

Description: Insulseal protective coating for insulation is available in two consistencies: Winter consistency "W" is treated to prevent freezing at low temperatures and where application is made at temperatures below 40°F. Summer consistency "S" is suited for application where coating has an opportunity to dry thoroughly before being subjected to freezing.

Coating is ready mixed and is applied about ¼" thick by trowel. Dried finish is black and leathery, and although it needs no painting, it may be painted to harmonize with surroundings or as required to identify pipe lines and other equipment.

(Product of Eagle-Picher Company, Dept. CP, American Building, Cincinnati 1, Ohio . . . or for more information check CP 2661 on handy form, pages 2 and 3.)

An all-purpose **PROCESS PUMP**

Featuring:

RUGGED CONSTRUCTION

LONG "IN SERVICE" CONTINUITY

EASE OF MAINTENANCE

COMPLETE SIZE RANGE

PEERLESS PUMPS

PEERLESS TYPE DS

CHEMICAL PROCESS PUMP

ESPECIALLY DESIGNED FOR YOUR CHEMICAL PROCESS APPLICATIONS

Simplicity in construction, ruggedly designed frame, case and liquid end, grease- or oil-lubrication, open or enclosed impeller construction; these are some of the many features of Peerless Type DS chemical process pumps. High temperature oil-lubricated type is provided with water-cooled packing gland and back plate. Grease-lubricated type is recommended for temperatures below 250° F. Mechanical shaft seal can be furnished when specified. The Peerless Type DS is one of the truly all-purpose chemical pumps available to industry today. A new Peerless bulletin gives you the complete details.

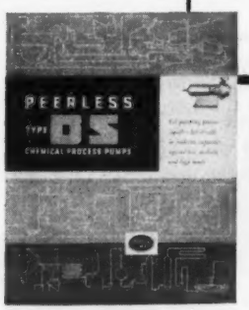
HERE ARE TYPE DS CHARACTERISTICS

CAPACITY: Up to 1500 gpm. **HEADS:** Up to 231 feet. **SIZES:** Complete range, 1 in. through 6 in. **IMPELLER:** Open or enclosed design, depending upon your requirements. **LUBRICATION:** Grease- or oil-lubrication, depending upon temperatures or intended service. **PACKING GLAND or MECHANICAL SHAFT SEAL** design available. Equipped with **CASE WEARING RINGS** for extra-low maintenance costs and extra-high maintained efficiencies. **LIQUID END** can be of any alloy.

PEERLESS BUILDS *Dependable* PUMPS

WRITE FOR BULLETIN

Completely describes and illustrates the Peerless Type DS chemical process pump. Profusely illustrated with cutaway pump views, sectional drawings, elevations and dimensional data and contains performance and complete construction details. Mail coupon today for your copy.



PEERLESS PUMPS fmc

PEERLESS PUMP DIVISION
FOOD MACHINERY AND CHEMICAL CORPORATION
Address inquiries to Factories at:
Los Angeles 31, California and Indianapolis 8, Indiana.
Offices: New York, Chicago, St. Louis, Atlanta, Tulsa; Dallas, Plainview and Lubbock, Texas; Fresno, Los Angeles; Phoenix, Albuquerque, N. M.

PEERLESS PUMP DIVISION
Food Machinery and Chemical Corporation
301 West Avenue 26
Los Angeles 31, California

Please send us a copy of Peerless Type DS Pump Bulletin No. B-1600.

NAME _____

COMPANY _____

STREET _____

CITY _____ STATE _____

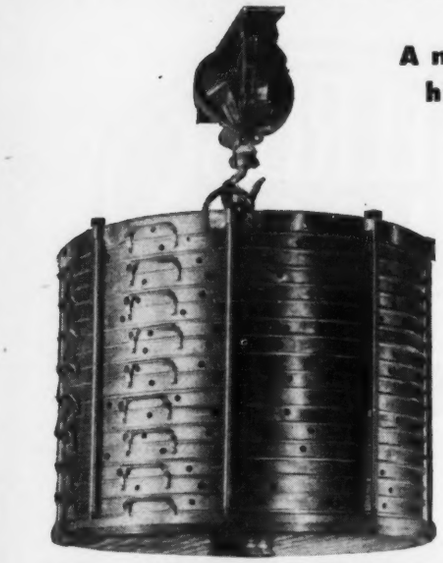
CHEM. PROC.

When inquiring check CP 2662 on handy form, pgs. 2-3

LESS DOWN TIME

WITH

SPARKLER FILTERS

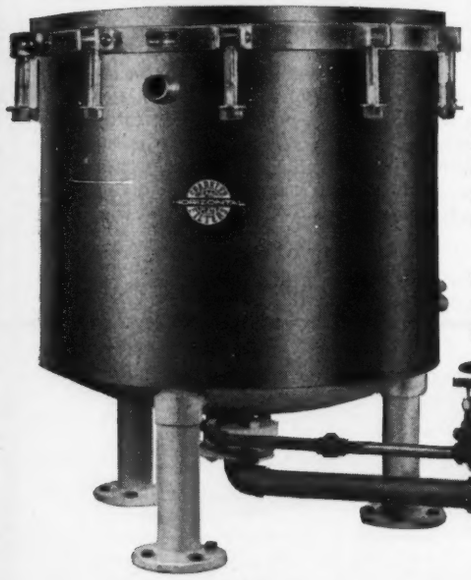


A matter of minutes not hours for a complete change of plates in a Sparkler filter.

No shut down of production to dismantle and clean each plate separately, then reassemble the complete filter, with hours of lost operating time and a messy clean up job.

The complete plate cartridge assembly is hoisted out of the Sparkler filter tank and a clean set of plates lowered in position and the filter is working again in a few minutes. Can you do this with your present filter?

One Sparkler filter with an extra set of plates is equal to two filters for continuous operation in most chemical production line installations.



Write Mr. Eric Anderson for personal engineering service on your particular filtering problem.

Makers of Filters for the Chemical, Pharmaceutical, Food and Petroleum Industries for over a quarter of a century.

SPARKLER MANUFACTURING COMPANY

Mundelein, Ill.

European plant: Herengracht 568, Amsterdam, Holland

When inquiring check CP 2663 on handy form, pgs. 2-3

CONSTRUCTION

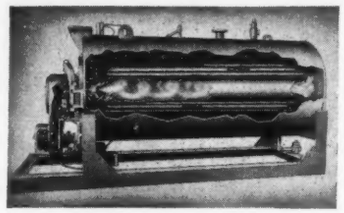
Simplicity is highlighted in construction, design of steam generator . . .

gives 80% efficiency; can be readied for cleaning in 15-20 min

Uses: Source for supply of heating and processing steam.

Features: Front and back can be opened in 15-20 min, providing ready access for interior cleaning and servicing. Unit is at least 80% efficient.

Description: Fully automatic and self-contained, unit is an improved 2-pass version of Scotch Marine type boiler; is ready for operation when service connections are made. Generator is available for use with heavy or light oil, gas, or a combination, and comes in sizes from 10 to 500 hp, 15 to 200 lb operating pressures. Steam moisture content is under 1%.



Packaged steam generator

Burner operation can be modulated from 35 to 125%, providing for periodic over surge whenever it might be required.

Fuel is burned in water-surrounded boiler furnace; gases pass spirally through large 3" tubes. Two-pass construction eliminates excess refractory since the only refractory required is at back of boiler. Fan used with burner is a forced-draft type; it handles only clean air at boiler room temperature, rather than flue gases at high temperature as with an induced draft fan.

("Continental" packaged steam generator is developed by the Boiler Engineering Company, Dept. CP, Phoenixville, Pa. . . . or for more information check CP 2664 on handy form, pages 2 and 3.)

Provides diffused light, lamp is designed for high places . . .

1000w fluorescent mercury lamp has isothermal shape

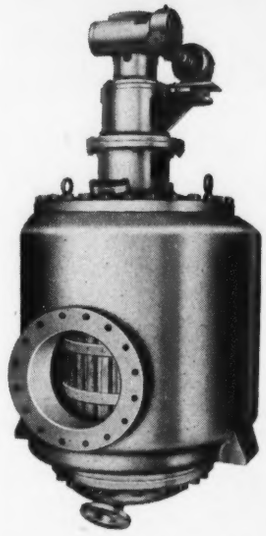
Designed for higher mountings and higher lighting levels both indoors and outdoors, 1000w fluorescent mercury lamp provides a golden white light suitable for all types of lighting service except where close color dis-

Continuously self-cleaning

ELLIOTT

Type K

WATER STRAINER



When relatively large quantities of foreign matter and debris are to be removed from water, let an Elliott Type K strainer take over. This improved strainer actually cleans itself continuously by back-flushing each straining unit successively. No lost time, since operation is completely automatic. Slow moving rotor holds power costs down, even for the largest size units.

Sizes 4" to 36". Working Pressure — 125 lb. gage. Send for the complete story. Write for the Type K Self-Cleaning Water Strainer Bulletin.

A 2-2

ELLIOTT Company

Accessories Dept., JEANNETTE, PA.

DISTRICT OFFICES IN PRINCIPAL CITIES

When inquiring check CP 2665 on handy form, pgs. 2-3

Champ Hot Water Team!

JOHNSON

Heater plus steam

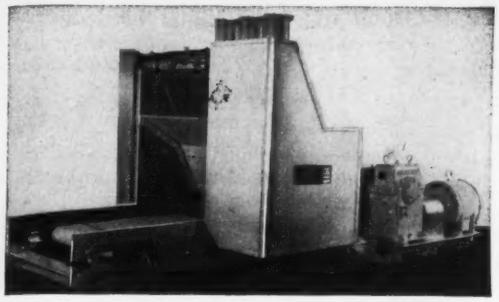
It's one of industry's favorite ways to heat water or process liquids of all sorts. Just hook up the Johnson "Instant" Heater to your high pressure steam lines; no reducers needed. Efficient design provides maximum contact between the water and steam-heated surfaces, transfers more heat more rapidly. Whatever your liquid heating job, get the Johnson money-savings facts.

Sizes for all needs; write for literature.

The Johnson Corporation

826 Wood St., Three Rivers, Mich.

When inquiring check CP 2666 on handy form, pgs. 2-3



"National" Chemical Extruder Assures Less Compact Material

In this modern "National" machine, a new ***wiping motion*** leaves the extruded material ***less compact*** . . . in better form for subsequent handling, and permitting the extruding of numerous materials that previously could not be processed. Automatic loading synchronized with extrusion operation. Designed for continuous tray or apron drying. Furnished in various sizes and capacities, and any required metal.

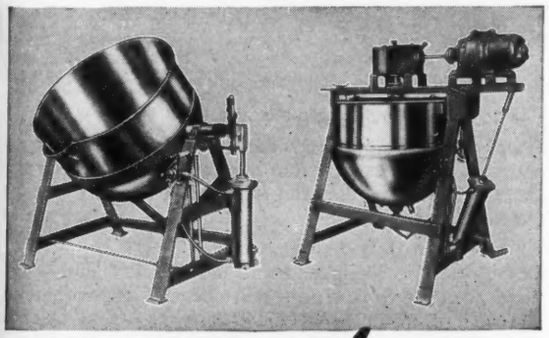
Write for Complete Information.

Chemical Dryers of All Types and Sizes — Special Drying and Heating Equipment

THE NATIONAL DRYING MACHINERY CO.

2709 N. Hancock Street, Philadelphia 33, Pa.

When inquiring check CP 2667 on handy form, pgs. 2-3



FOR SAFETY-*choose*

LEE

Corrosion-Resistant

KETTLES

WITH HYDRAULIC OPERATING CYLINDERS •

Free! New Technical Bulletins

LEE METAL PRODUCTS CO. INC.

418 PINE STREET . . . PHILIPSBURG, PA.

ALL LEE KETTLES ARE MADE TO A.S.M.E. CODE

When inquiring check CP 2668 on handy form, pgs. 2-3

CONSTRUCTION

crimination is involved. Specially developed isothermal shape (15⅜" overall length) allows phosphor coating to function at maximum efficiency.

When activated by invisible ultraviolet light from the quartz arc, the phosphor gives off red light. This blends with the blue-green-white light from the mercury arc to give a golden white light with approximately the same color quality as a mixture of equal wattages of mercury and incandescent light. Inside frosting of the bulb provides better diffusion of light and greater uniformity of color. Specifications are shown below:

Rated average life	4000 hr*
Rated initial lumens	50,000 (approx.)
Open circuit voltage	220**
Operating voltage	135 approx.
Starting current	12 amp approx.
Operating current	8.2 amp approx.
Starting time to full output	4 min
Restarting time	6 min

* — Under specified test conditions at 5 or more burning hours per start.

** — For normal indoors use. Higher open circuit voltages are desirable for dependable starting at lower temperatures.

(Model C-H12 is developed by the Westinghouse Electric Corporation, Dept. CP, Lamp Division, Bloomfield, N. J. . . . or for more information check CP 2669 on handy form, pages 2 and 3.)

Light weight permits easy installation of plastic fittings . . .

can be incorporated into existing pipe lines

Uses: In pipe lines carrying chemicals, sewage, waste, drinking water, or other liquids.

Features: Corrosion resistance, light weight, adaptability into existing pipe lines, and fully welded construction.

Description: Agilene brand flanged pipe fittings are fabricated from polyethylene plastic. They are available as tees, crosses, 45 and 90° elbows in up to 6" nominal pipe size. Manufacture is according to standard dimensions of the American Standard Class 125 Cast Iron Flanged Fittings.

It is recommended that they be used with split sheet metal back-up flanges to avoid deformation of the flanges through bolt pressure.

(Manufactured by American Agile Corp., Dept. CP, P.O. Box 168, Bedford, Ohio . . . or for more information check CP 2670 on handy form, pages 2 and 3.)

NYLON Filter Cloth

Again You Can GET It From Us!

- Select from all standard weaves
- Select from all standard widths
- In roll lengths or less
- As prepared filter element covers sewed with Nylon thread.

And since you can once more turn to Nylon Cloth, it might be well to review its outstanding filtering values:

- highly resistant to most common alkalies, common organic acids and many other chemicals.
- highly resistant to heat; permissible temperatures up to 250°F; its superiority pronounced in the 200°-250° range.
- unaffected by fungi, molds and bacteria; also unaffected when steam-sterilized making it ideal for filtering food products, pharmaceuticals and other products where contamination is a factor.
- highest tensile strength of all fibers, natural and synthetic; outstanding flex and abrasion resistance factors.
- smooth, non-clinging surface for easy cake discharge.

Before ordering, write us for laboratory test samples to re-check its values for your requirements.

Weavers of Industrial Filter Media for over Forty Years

The National Filter Media Corp.

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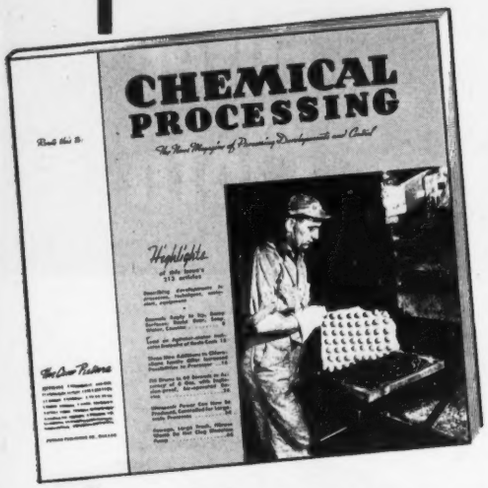
When inquiring check CP 2671 on handy form, pgs. 2-3

Have you ever wondered . . .?



How this magazine comes to you . . . why there's no charge for it ? ? ?

MAYBE, like many others, you've always thought that all publishers make their money, or much of it, from the subscriptions they sell.

'Tisn't so . . .

No, 'tisn't so. With the exception of a few general magazines (e.g. READER'S DIGEST) that sell hundreds of thousands — some millions of copies — most industrial publishers with relatively small circulations actually lose money on their subscription sales.

Then how do industrial publishers make money? As you can guess, they make it from the advertising they sell. Total subscription sales are hardly a "drop in the bucket" compared to advertising revenue.

Advertisers demand best coverage.

Since advertisers pay the bills, they demand best possible coverage of ALL important men in the field. So it's up to the publisher to publish the most readable magazine possible . . . then to insure coverage of the maximum number of the best readers.

. . . And you can't do that by *selling* subscriptions — sales costs are high — a large share of the subscribers cancel each year — and no matter how much time, money, and pressure is used there are always some of the important men who *will never buy*.

As you can see, the most effective method of getting the kind of coverage advertisers want is (a) to handpick the most important men and (b) send the magazine to ALL these men. That's why you get CHEMICAL PROCESSING free — that's why we spend thousands of dollars on each issue to make it worth your time to read it. For you are an important reader in the chemical processing field.

Have you other questions? Please write us.

Obviously, we can't answer all questions here; e.g. questions such as why some publishers drive so hard to get subscriptions. Briefly the answer to that one is, they get a postal subsidy on "paid subscription". But we choose to send CHEMICAL PROCESSING to all the important men who can be interested in reading it. We pay extra postage to give this service to all men like yourself, rather than miss those who can't be forced to pay a subscription fee. That way, we get best coverage for our advertisers too.

If you'd like to know more of the answers to such questions, drop us a line and ask the questions you have in mind. We'll do our best to answer.

Moreover, we'd appreciate hearing from you. Won't you write us, telling us what you think of CHEMICAL PROCESSING, how you use it, or how you think we could make the publication better.

CHEMICAL PROCESSING
***Published by* PUTMAN PUBLISHING COMPANY**

Creators of PUTMAN-STYLE Magazines . . . terse, vital editorial; "hand-picked" circulation; square, high-visibility format; quality readership; hence more READER ACTION

Wide variety of uses are possible with spray-throwing nozzle . . .

can be used for cleaning, washing, applying chemicals, and as fire fighting equipment

Uses: For cleaning, washing, applying chemicals, and for certain types of fire protection. Can also be used in control of brush near buildings and sidings.

Features: Portable fog spray nozzle has handy 3 ft applicator, positive shut-off, and garden hose connection.

Description: Atomizing elements of the HX5 nozzle are a series of interchangeable fan spray discs, precision machined from solid stainless steel. Discs are available for fan angles from 10 to 90° with a 1/10 to 8 gpm flow. Applicator is of lightweight aluminum tubing furnished straight or bent 30°. Nozzles operate at 30 to 100 psi.

Portable fog spray nozzle has many uses

(Product of Bete Fog Nozzle Inc., Dept. CP, 85 Pierce St., Greenfield, Mass. . . . or for more information check CP 2672 on handy form, pages 2 and 3.)

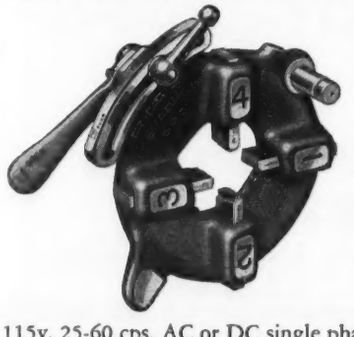
Removal is unnecessary in adjusting die head on pipe and bolt threading machine . . .

Quadritype adjusts to 1 or 2″ pipe, including over and under size easily and quickly

Uses: For threading pipes and bolts.

Features: Self-contained die head is instantly adjustable without being removed from pipe and bolt threading machine. Quadritype die head is designed for 1 or 2″ pipe, including over and under size, regardless of position of quick-opening lever.

Description: Designed for manufacturer's "500" Series, three other heads are provided: Dualtype (one for ¼ and one for ⅜″) Monotype (⅛ to 2″), and bolt die heads (¼ to 2″). All tools in the "500" Series thread, cut, and ream independently, close to the chuck, and swing out of the way when not in use. Thread oil system is entirely concealed. Chuck has six adjusting pinions. Motor supplies ample power even for pipe to 12″ when geared tools are used, is universal forward-reverse, 115v, 25-60 cps, AC or DC single phase. The series comes in bench and stand models, latter open or closed, with or without wheels.



(Product of the Ridge Tool Co., Dept. CP, Elyria, Ohio . . . or for more information check CP 2673 on handy form, pages 2 and 3.)

Forms tough, flexible surface coating on conveyor belts . . .

effects savings in replacement and maintenance costs

Uses: Repairing, resurfacing, and lining all types of equipment, such as: conveyor belts, tripper chutes, hoppers, flumes, centrifugal pumps, mixing tubs, classifiers, agitators, baffle plates, cables, hose, tubes and flooring.

Features: High corrosion and abrasion resistance. Equipment ready for use after 12-hr cure of compound.

Description: A self-curing plastic-rubber compound, Magic-Vulc is supplied in paste form ready to apply. It is used cold and forms a tough, flexible covering.

As an indication of its value in reducing maintenance costs, a case is cited where the compound is effecting a savings of some $4000 a year by protecting steel plates. Prior to its use, these plates (making up a spreading table for sand) were replaced every 3 or 4 weeks. After resurfacing with Magic-Vulc it is stated that more than 400 weeks' use have been given.

Compound is applied with a spatula in a layer not more than 1/8" thick — at one time. In conveyor belt use, a 20-lb can coats an area of 75 to 100 sq ft, depending on condition of belt. No experience needed to apply it.

(Available from Magic Chemical Co., Dept. N17-CP, 121 Crescent St., Brockton 2, Mass. . . . or for more information check CP 2674 on handy form, pages 2 and 3.)

Four types featured in tank book

Illustrated with large photographs, cutaway drawings, and engineering drawings, this 12-page book presents the workings, construction and details of outdoor storage tanks. Four types of tank are featured — two floating roof designs, and one each of an expansion type and a vapor-retaining design.

A full-page plot gives values of average annual evaporation from tanks of various capacities for liquids with vapor pressures between 1 and 14.7 psi. "Double Deck Floating Roof Tanks" is issued by Graver Tank and Manufacturing Co., Dept. CP, East Chicago, Ind. When inquiring specify CP 2675 on handy form, pages 2 & 3.

For more information on product at right, specify CP 2676 . . . see information request blank between pages 2 and 3.

Your welders will seem like

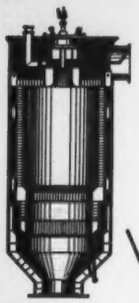
Siamese Twins

When they use Midwest Welding Fittings, your welders will turn out so much more work that they'll seem like Siamese Twins. The reason? . . . The exceptional accuracy and uniformity of Midwest Welding Fittings enable your welders to spend more time welding and less time in preparation.

MIDWEST WELDING FITTINGS IMPROVE PIPING DESIGNS AND REDUCE COSTS

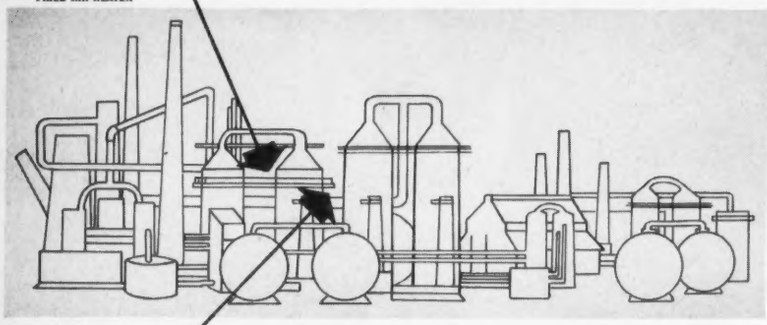
MIDWEST PIPING & SUPPLY CO., Inc.

Main Office: 1450 South Second Street, St. Louis 4, Mo.
Plants: St. Louis, Passaic, Los Angeles and Boston
Sales Offices: New York 7—50 Church Street • Chicago 2—79 West Monroe St.
Los Angeles 33—520 Anderson St. • Houston 2—1213 Capitol Ave.
Tulsa 3—224 Wright Bldg. • Boston 27—426 First St.
STOCKING DISTRIBUTORS IN PRINCIPAL CITIES



PEABODY DIRECT FIRED AIR HEATER

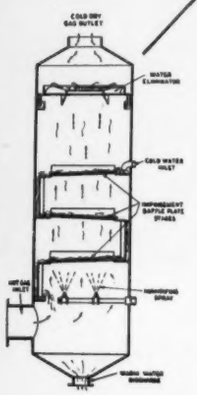
more effective processing



safeguarded by

...PEABODY SCRUBBERS, COOLERS AND ABSORBERS

— incorporating a patented Impingement Baffle Plate, are widely adaptable and custom-engineered. Peabody units increase process effectiveness, safeguard process quality and assure operating economy. On any gas cleaning, cooling or absorbing problem, look to Peabody for a dependable, custom-engineered solution. Bulletin 203A.



PEABODY GAS SCRUBBER

...PEABODY DIRECT FIRED AIR HEATERS

— safeguard the processing of industry's leading firms by delivering high-pressure, as well as high-temperature, gases. Individual designs are available for operation at approximately atmospheric pressure and for various pressure ranges up to and exceeding 100 PSIG. Available in capacities of 1,000,000 to over 100,000,000 B.T.U./hr. Compact, job-engineered design minimizes field installation. Bulletin 600B available on request.

PEABODY
ENGINEERING CORPORATION
580 FIFTH AVENUE • NEW YORK 19, N. Y.
Manufacturers of all types of combustion equipment, direct-fired air heaters, gas scrubbers, coolers, and absorbers

OFFICES IN PRINCIPAL CITIES
PEABODY LIMITED • LONDON, S.W.1, ENGLAND

911

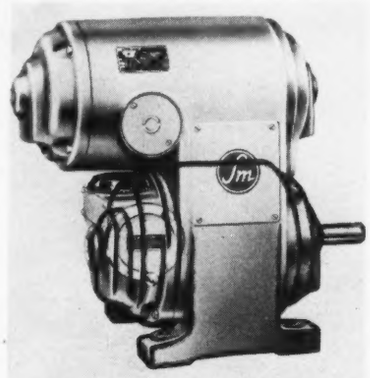
When inquiring check CP 2677 on handy form, pgs. 2-3

CONSTRUCTION

No special base needed for mounting motor speed drive . . .

interchangeability is feature of variable speed units

Variable speed drive is designed to eliminate necessity of building special bases where interchangeability between variable speed drives and standard NEMA motors is required. Drive consists of a variable speed transmission with positively adjusted pulleys and an induction motor built in a



Mounting dimensions are interchangeable with standard NEMA motors

single, compact unit. Single phase units are available in sizes from 1 to 3 hp, and polyphase in sizes from 1 to 15 hp with 2-1, 3-1, or 4-1 variation, and drip-proof, splash-proof, totally enclosed design.

(Product of the Sterling Electric Motors, Inc., Dept. CP, 5401 Anaheim — Telegraph Rd., Los Angeles 22, Calif. . . . or for more information check CP 2678 on handy form, pages 2 and 3.)

Occupies 1/2 floor space as pumps used for same job . . .

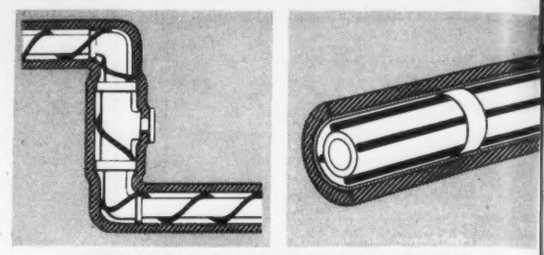
uses mechanical shaft seals instead of customary packing

Uses: For pumping water and clear liquids up to 200°F where no solids are in suspension.

Features: Shaft is about 1/2 the length of conventional pump shafts – resulting in a corresponding reduction in shaft deflection.

Description: Peerless Type AS pump occupies approximately 1/2 the floor space required by other types of general purpose pumps. This saving is made possible by elimination of packing gland housings — utilizing mechanical seals instead.

Horizontal, split-case design allows for the top half to be removed easily for



HEAT PIPES easily and economically with G-E Calrod* heaters or heating cable. Wrapped around or clamped on, they're easy to install.

G-E CALROD* HEATERS GIVE EFFICIENT PIPELINE HEATING

To speed the flow of viscous materials such as plastics, asphalt, oils, foods, molasses—install G-E heating cable or tubular heaters now. Wrapped around or clamped on pipes, they do an economical and efficient job of warming the contents of pipes. Heating cable will help to prevent water pipes and valves from freezing and bursting. And G-E thermostatic control makes both jobs automatic.

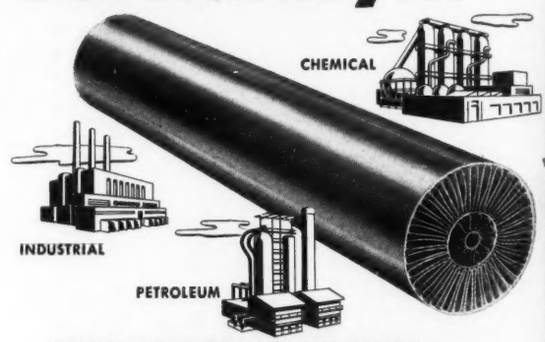
FOR FREE BULLETINS, complete catalog of heaters and devices, GEC-1005, and "Heating Pipelines," GEA-5095, call your nearby G-E Sales Office or write: Section 720-74, *General Electric Company, Schenectady 5, N. Y.*

*Registered Trade-mark

GENERAL ELECTRIC

When inquiring check CP 2679 on handy form, pgs. 2-3

Versatility...



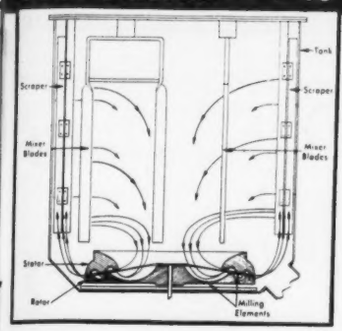
HEAT-X LONGITUDINAL FINNED TUBING has been discovered by engineers and designers in many fields to be a more efficient type of surface for the heat transfer of most liquids and gases. Constructed with a large amount of surface compressed into the smallest possible volume, Heat-X Longitudinal Finned Tubing provides for maximum space saving, minimum pressure drop. Available in sizes from 5/8" O.D. to 2 1/8" O.D. and lengths up to 10 feet.

Write today for complete specifications

THE HEAT-X-CHANGER CO., INC.
BREWSTER, NEW YORK

When inquiring check CP 2680 on handy form, pgs. 2-3

Mix... Mill... Blend... Emulsify Your Pastes in *One Operation*



You can obtain much faster, far more thorough mixing of your pastes and get products of materially better uniformity with the

ABBÉ DISPERSALL MIXER

Here's How It Works: Double rotating paddles (plus the scraper action) keep the mass in vigorous agitation, speedily and thoroughly mixing the ingredients. At the same time the mix is fed down and through the rapidly rotating milling element with cupped rotor-stator. Here, by means of a combination of impact and shear, agglomerations of solids and liquid globules are broken up into very small size, while violent turbulence moves dispersion, emulsification and blending faster toward the final goal.

If you mix pastes in any volume, ask us to send Catalog 68, so you can study the unique process possibilities of this MIXER.

ABBÉ ENGINEERING CO. 46 CHURCH STREET NEW YORK 7, N. Y.

Makers of

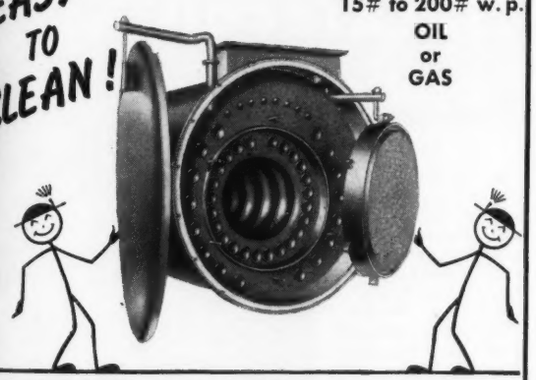
ABBÉ ENGINEERING Ball, Pebble and Jar Mills

When inquiring check CP 2681 on handy form, pgs. 2-3

AMESTEAM GENERATOR

EASY TO CLEAN!

10 to 500 h.p.
15# to 200# w.p.
OIL or GAS



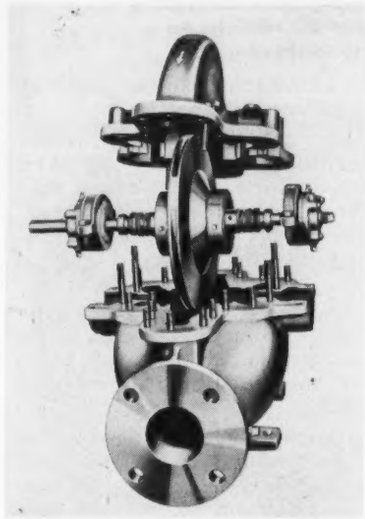
To Completely Expose Furnace and All Tubes . . . Open One - Piece Rear Flue Cover . . .

Then Open One - Piece Rear Baffle. There are Ample Clean-Out Doors in Front End, too!

AMES IRON WORKS
BOX D-5 OSWEGO, N.Y.

Builders of Better Boilers Since 1848

When inquiring check CP 2682 on handy form, pgs. 2-3



Horizontal, split-case design permits easy removal of top half

inspection and maintenance. Types of drives available include: electric motor, gasoline engine and steam turbine. General characteristics follow:

Discharge sizes	1½ through 4"
Capacities	up to 750 gpm
Heads	up to 230′

(Manufactured by Food Machinery and Chemical Corp., Peerless Pump Division, Dept. CP, 301 W. Avenue 26, Los Angeles 31, Calif. . . . or for more information check CP 2683 on handy form, pages 2 and 3.)

Welding rod holder designed to speed production . . .

tip insulation withstands impact, heat and will not carbon char

Uses: Will handle 7/32 through 1/16" electrodes

Features: Lightweight, high copper alloy for maximum conductivity; tip insulation withstands high impact, heat and will not carbon char.

Description: Model A-732 Twecotong Holder is designed for high speed production, pipe welding and job shop work. Welding cable may be soldered or clamped mechanically to the body of the holder which is 9¼" in length.

Tip end insulators are interchangeable, and current capacity is 300 amp. Raised upper lever allows a maximum amount of room for the operator's hand with a welding rod in the jaws.

(A product of Tweco Products Co., Dept. CP, P.O. Box 666, Wichita 1, Kan . . . or for more information check CP 2684 on handy form, pages 2 and 3.)

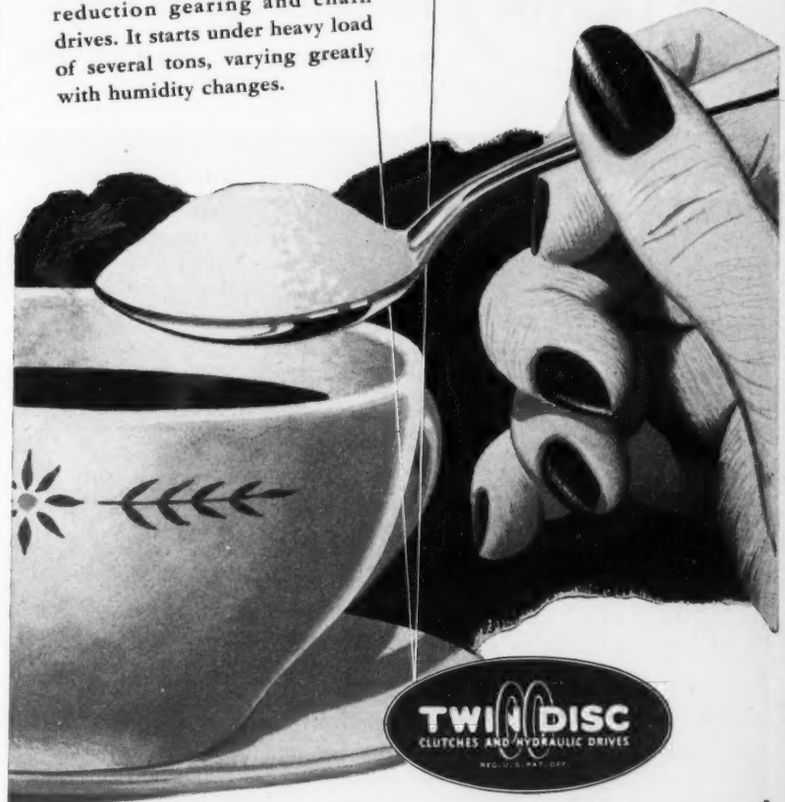
A Sweet Story

"In October, 1950," reports our hydraulic drive dealer, Curtis Engine and Equipment Company, "we sold to American Sugar Refining Company of Baltimore, a Model HCB 17.5" Twin Disc Hydraulic Coupling for operation on a continuous bucket conveyor used to transfer over 1,000,000 pounds daily of raw sugar from dockside through their refinery.

"The Twin Disc Coupling was installed on a 15 hp. motor which replaced the original 20 hp. unit. The conveyor is driven through reduction gearing and chain drives. It starts under heavy load of several tons, varying greatly with humidity changes.

"High maintenance cost due to excess vibration of the entire system, frequent jamming of the old drive and excessive starting torque have been corrected. The coupling allows for smooth, gradual load pickup, even though a 25% smaller motor is used."

Slipped on the electric motor (or engine) shaft in a few minutes, the Twin Disc HYDRO-SHEAVE® helps little motors (and engines) do bigger jobs; provides a cushion against shock-loading, improves the power-factor with smooth acceleration. For all motors and engines developing from ¾ to 50 hp.



TWIN DISC CLUTCH COMPANY, Racine, Wisconsin • HYDRAULIC DIVISION, Rockford, Illinois

BRANCHES: CLEVELAND • DALLAS • DETROIT • LOS ANGELES • NEWARK • NEW ORLEANS • SEATTLE • TULSA

When inquiring check CP 2685 on handy form, pgs. 2-3

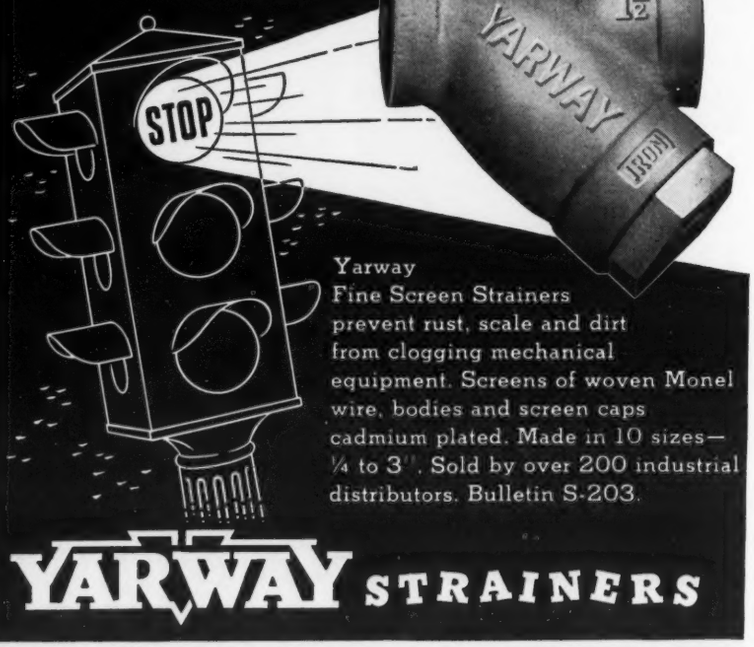
Rugged, effective vibration without damage to your bins and hoppers when you use the patented Peterson pneumatic VIBROLATOR.

Effective all-directional vibration for moving stubborn materials in hoppers and bins. Instantly self-starting, no lubrication or maintenance needed. A variety of sizes available to meet all applications. Whatever your vibrator requirements, there's a Peterson Vibrolator to fit the job and do it more efficiently.

MARTIN ENGINEERING COMPANY
KEWANEE 1, ILLINOIS

When inquiring check CP 2686 on handy form, pgs. 2-3

SAYS STOP TO SOLIDS



Yarway Fine Screen Strainers prevent rust, scale and dirt from clogging mechanical equipment. Screens of woven Monel wire, bodies and screen caps cadmium plated. Made in 10 sizes—¼ to 3". Sold by over 200 industrial distributors. Bulletin S-203.

YARWAY STRAINERS

YARNALL-WARING CO., 125 Mermaid Ave., Philadelphia 18, Pa.

When inquiring check CP 2687 on handy form, pgs. 2-3

CONSTRUCTION

Supply pore diameters from 20 microns to 0 in ss sheet . . .

surface smoothness comparable to commercial rolled product

Uses: Applications would include use on rotary vacuum filters cleaned by blowback, on vacuum plate filters, fluid catalyst filters where cake is not readily discharged by blow-back, and similar solids collection service.

Features: Supplied with high mechanical properties; for example, shear strengths are in the range of 60,000 psi. Surface smoothness is comparable with commercial rolled stainless steel sheet finishes.

Description: Flow capacities of Micro Metallic Corp.'s porous stainless steel sheets range downward from 200 cfm of air per sq ft of filter surface at 10 psi differential pressure, or from 20 gpm per sq ft of water at 10 psi differential. Pore diameters from 20 microns to zero available.

Porous material will be stocked in type 304 stainless steel, but is available on special order in other stainless steels, such as type 309, 316, and type 347; also in nickel-base alloys, such as monel, as well as cobalt-base Stellite L-605, which is of particular interest in high-temperature service.

(Manufactured by Micro Metallic Corp., Dept. CP, 30 Sea Cliff Ave., Glen Cove, N. Y. . . . or for more information check CP 2688 on handy form, pages 2 and 3.)

Feature plenty of space in sections of steel drawers . . .

units can be stacked collectively for compact storage

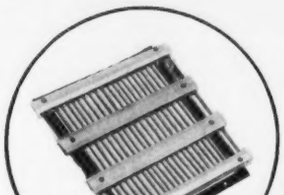
Uses: For storing laboratory supplies, nuts, screws, bolts, or other small parts in plant; or for filing purposes.

Features: Made of heavy duty steel, drawers can be stacked in sections or used individually.

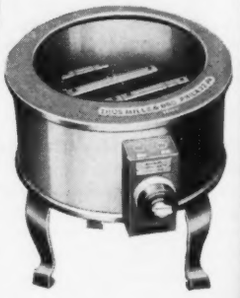
Description: Latest size of the drawer unit is 5½ x 3½ x 17". Drawers come equipped with two dividers adjustable on 1" centers. Sturdy steel frames stack on each other to accommodate a maximum of material in a minimum of space. Overall size of the cabinet is 18" deep x 14" high x 34" wide. Finished in olive green baked-on enamel.

(Product of Equipto Division of Aurora Equipment Co., Dept. CP, Aurora, Ill. . . . or for more information check CP 2689 on handy form, pages 2 and 3.)

Another Application for TRENT "Folded-and-Formed" Heating Elements



Standard Racks in CANDY FURNACE



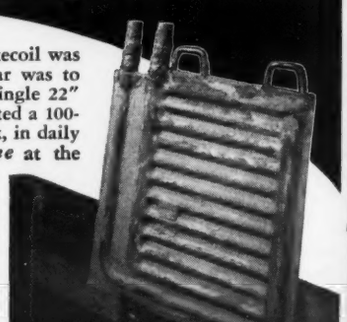
The efficiency of this Candy Furnace is due in large measure to the quick heating and reliable, trouble-free performance of the TRENT Patented "Folded-and-Formed" Heating Elements covering the bottom of the cooking chamber. Furnace is designed to hold Candy Pan at proper height above heating elements, and is equipped with three-heat switch. The furnace is adaptable to a wide variety of other uses, in the food-processing and chemical fields.

TRENT Standard or Custom-built Heating Element Racks can solve YOUR electric heating problems . . . efficiently and economically. Write for recommendations.

TREN INC
Electrically Heated Industrial Equipment
235 LEVERINGTON AVE. PHILA 27, PA

When inquiring check CP 2690 on handy form, pgs. 2-3

NO DOWNTIME in over a year using a PLATECOIL (REPLACES PIPE COIL) in a parkerizing tank



The only time this Platecoil was removed in over a year was to take its picture. The single 22" x 23" Platecoil has heated a 100-gallon Parkerizing tank, in daily use, *without downtime* at the Lycoming Spencer Division of Avco Corp. Built of Electro-Polished Stainless Steel, the Platecoil has required no cleaning or repairs. Platecoils will replace pipe coils at a savings in any heat transfer application.

Send for complete technical manual and descriptive Bulletin No. P54.

PLATECOIL Division
KOLD-HOLD MFG. CO.
LANSING 4, MICHIGAN

When inquiring check CP 2691 on handy form, pgs. 2-3

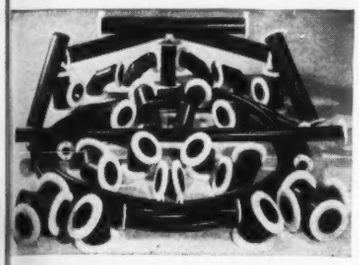
Chemical-resistant plastic piping withstands temperatures of +150 to −50°F . . .

lightweight, semi-flexible, requires only hack saw and screwdriver for installation

Uses: For transportation of liquids. Can also be used for sewage and acid drainage, for fume piping, and for corrosives.

Features: Plastic piping is tough, durable, and chemically resistant. Withstands temperatures ranging from +150 to −50°F. Lightweight and semi-flexibility make it easy to install. (A hack saw and screwdriver are the only tools required.)

Description: Cyclothene plastic pipe is made in all sizes from ½ to 6". Is furnished in stock lengths of 25' in 4" or larger pipe, 150' coils for 3" pipe, 250' coils for 2" pipe, and up to 400' in smaller sizes. Piping is readily connected with knurled and insert connectors clamped with stainless steel bands. A standard pipe thread adapter is also available where connection to other equipment is desired. Can be furnished with welded-on flanges in specific lengths. Ells, tees, and Y's can be fabricated as needed. Electrical properties of the material make it well suited as a conduit.



Semi-flexible plastic piping has high resistance to chemicals and solvents

(Development of the Munray Products, Inc., Dept. CP, 12400 Crossburn Ave., Cleveland 11, Ohio . . . or for more information check CP 2692 on handy form, pages 2 and 3.)

Drawings, tracings reproduced quickly for permanent reference . . .

copying machine has 46" width to handle either roll stock or cut sheets at 12 fpm, needs no ink

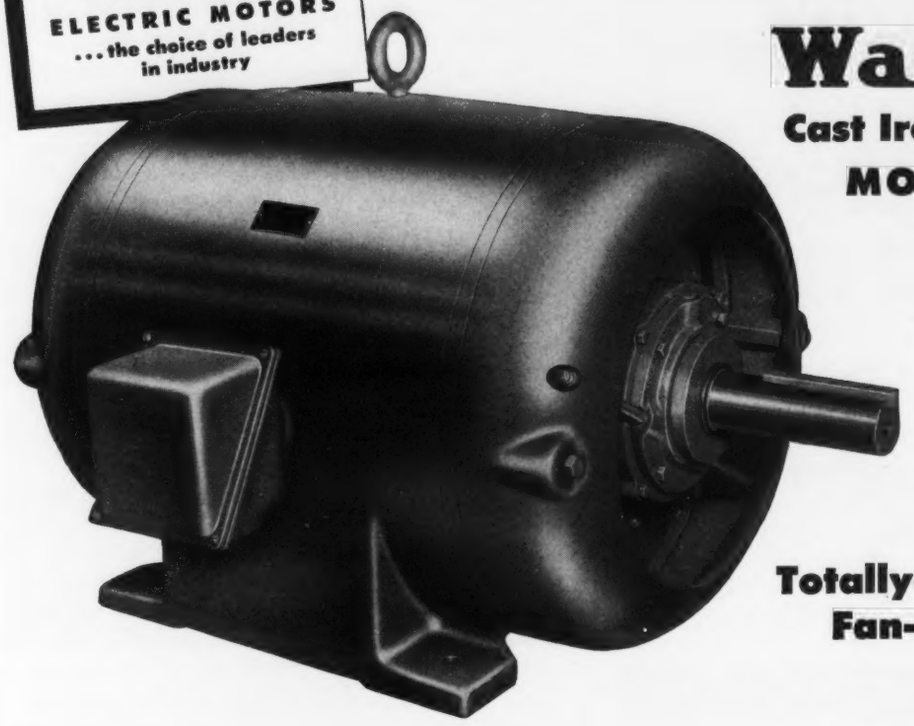
Uses: For copying drawings, tracings, records, charts, statements, and reports used in production, sales, inventory, and cost control.

Features: High speed copying machine has 46" printing width to handle standard 42" roll of stock or insertion of multiple cut sheets of copying paper at rate of 12 linear feet per minute. No ink, negatives, dark room, or special plumbing are needed.

Description: Copyflex Model 30 uses a 48", 2000w mercury arc lamp to insure uniform exposure. Prints are ready for immediate use upon delivery by the machine. Whiteprinter requires no installation other than connection to a 230v 60 cps AC line. Fifty cycle machines are also available. Copies may be made on sensitized paper, acetate-coated paper, film, and cloth. In operation, a single control switch is used to turn on machine, while another regulates the printing speed.

(Product of the Charles Bruning Company, Inc., Dept. CP, 125 North Street, Teterboro, New Jersey. . . . or for more information check CP 2693 on handy form, pages 2 and 3.)

Wagner
ELECTRIC MOTORS
. . . the choice of leaders in industry



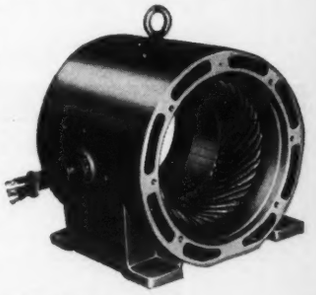
Wagner
Cast Iron Frame
MOTORS

Totally-enclosed
Fan-cooled

Built for use in corrosive atmospheres

Wagner Cast Iron Frame Motors are designed to provide the corrosion resistance demanded by applications in chemical plants or in other applications where protection against corrosion is required. They feature completely protected laminations . . . special varnish treated windings . . . a cast iron, gasket-sealed conduit box . . . a running shaft seal . . . and are totally-enclosed and fan-cooled for complete protection against acids and alkalies present in the atmosphere in the form of dust, fumes or moisture. The photo at right illustrates the rugged, one piece cast iron frame, showing openings for ventilation.

Where additional protection against explosive atmospheres is desired, an explosion-proof design (type JP) is available. Both the standard (type EP) and the explosion-proof types are built in ratings from 2 to 250 hp., with either normal or high torque characteristics. Non-ventilated 1 and 1½ hp. motors also available. Wagner Bulletin MU-132 gives complete information on these corrosion-resistant motors. Write for your copy today.



WAGNER ELECTRIC CORPORATION
6359 Plymouth Ave., St. Louis 14, Mo., U.S.A.

® Wagner Electric Corporation
EST. 1891

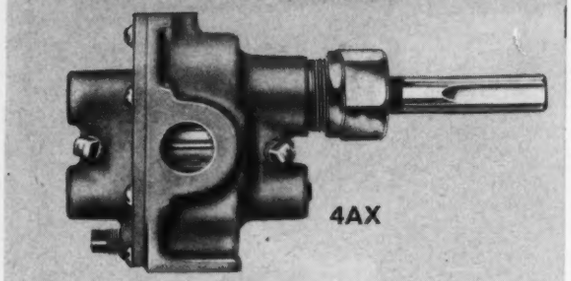
ELECTRIC MOTORS • TRANSFORMERS • INDUSTRIAL BRAKES
AUTOMOTIVE BRAKE SYSTEMS — AIR AND HYDRAULIC

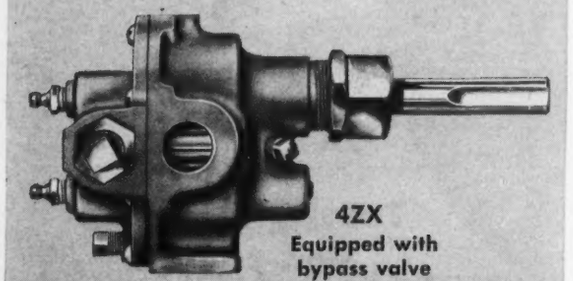
BRANCHES IN 32 PRINCIPAL CITIES

M52-18

When inquiring check CP 2694 on handy form, pgs. 2-3

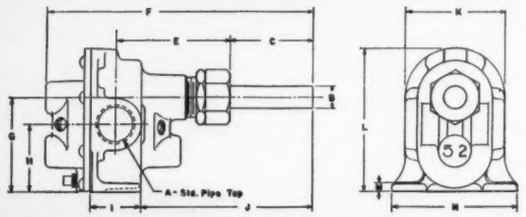
Standard OBERDORFER Series 52 BRONZE ROTARY GEAR PUMPS





CAPACITY TABLES Gallons per minute — 1,725 R.P.M. — lbs. sq. in.

Pump No.	2 lbs.	20 lbs.	40 lbs.	60 lbs.	80 lbs.	100 lbs.
No. 1½	2.10	1.92	1.75	1.63	1.55	1.50
No. 2	4.10	3.75	3.58	3.42	3.25	3.17
No. 3	7.42	7.08	6.75	6.50	6.33	6.17
No. 4	10.67	10.17	9.67	9.17	8.83	8.50
No. 7	19.75	19.33	19.00	18.67	18.33	18.08
No. 9	23.33	22.92	22.50	22.08	21.67	21.33



DIMENSION TABLE—SERIES 52 PUMPS

Pump No.	A	B	C Min.	E Max.	F	G	H	I	J	K	L	M	N	O
1½	⅛	⅜	2 1/16	2 21/32	6¼	1⅞	1 13/32	1 1/16	4 1/16	1 15/16	2 27/32	3/16	2¼	1 5/16
2	⅛	½	1⅞	2 31/32	6 9/16	2 23/64	1 23/32	1 9/32	4 1/32	2⅜	3 9/16	¼	2⅞	1 1/16
3	⅜	⅝	2¼	3 1/32	7 1/16	2⅝	1⅞	1 9/32	4 17/32	2¾	4	¼	3½	1⅛
4	⅜	⅝	2¼	3¼	7 1/16	2⅝	1⅞	1 13/32	4 25/32	2¾	4	¼	3½	1⅛
7	¾	⅝	2¼	3 5/16	7 1/16	3 9/16	2 9/16	1 13/32	4 25/32	3⅜	5¼	5/16	4	1 9/16
9	1	⅝	2¼	3 5/16	7 13/16	3 9/16	2 9/16	1 23/32	4 25/32	3⅜	5¼	5/16	4	1 9/16

PRICE LIST

Pump No.	No. 1½	No. 2	No. 3	No. 4	No. 7	No. 9
Pipe Size	⅛"	¼"	⅜"	½"	¾"	1"
AX	$11.25	$13.25	$15.50	$17.00	$22.50	$23.75
ZX	15.25	17.50	20.50	22.00	27.75	29.00

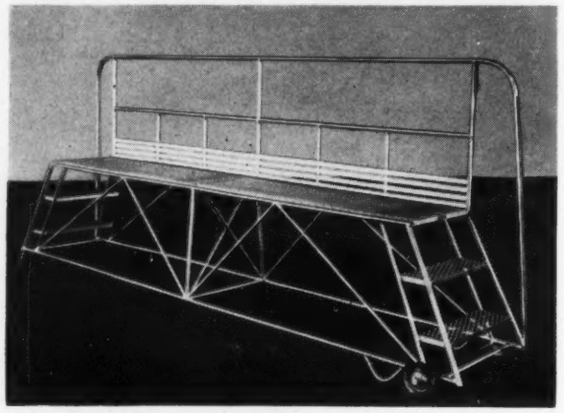
Industrial Pump Div., Oberdorfer Foundries, Inc.
625 Thompson Rd., Syracuse, N. Y.

When inquiring check CP 2695 on handy form, pgs. 2-3

Safety and mobility are combined in sturdy, portable platform with ample space . . .

can be built to meet special dimension requirements for application

Portable platform is designed for assembling or inspecting large machinery, bus and truck maintenance, and similar purposes. Rigid and sturdy, platform can be built to meet specific requirements for length, height, width and rail construction. All-steel welded tubing, expanded metal



Portable platform speeds assembly, inspection, and maintenance

treads, and platform provide safe footing and ample space for both tools and workers. Eliminates need for horses-and-planks platforms, temporary scaffolding, and heavy wooden structures.

(Product of the Ballymore Company, Dept. CP, Wayne, Pa. . . . or for more information check CP 2696 on handy form, pages 2 and 3.)

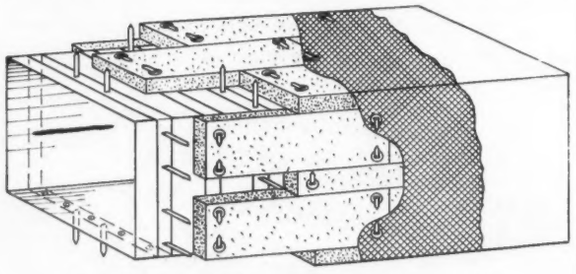
Around tanks, ducts, or on flat walls, strapping is easily applied to hold insulation . . .

combination of steel fingers and metal strapping secure insulation in quick operation

Uses: For permanently holding insulation material to pipes, ducts, tanks, or flat walls.

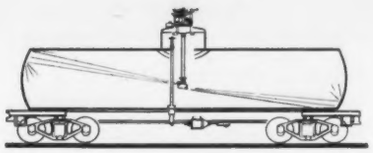
Features: Operation of securing the insulation to the metal strapping with steel "fingers" takes few seconds.

Description: Finger Strap is available in continuous coils in plain steel, galvanized, stainless, or monel, and is



For quick, permanent securing of insulation materials

¾" wide. Thicknesses range from 0.015 to 0.035". The fingers are from 1⅜ to 4½" in length as specified, ¼" wide and tapered, and are spaced at intervals from 5 to 12". They are easily raised to impaling position, yet are



Clean Your Tank Cars in HOURS Instead of DAYS

WITH the Oakite Interior Tank-Cleaning Unit, you can often cut cleaning time as much as 75%, sometimes even more! Brushing, scrubbing, steaming out and similar laborious practices are eliminated. This means you not only save time, you also free personnel for more important duties.

The combined cleaning action of heat, force and heavy-duty Oakite detergency thoroughly removes even the most stubborn residues. Try it . . . and the savings you make will speak for themselves. Write for further FREE information to Oakite Products, Inc., 18F Rector Street, New York 6, N. Y.

SPECIALIZED INDUSTRIAL CLEANING
OAKITE
MATERIALS • METHODS • SERVICE

Technical Service Representatives in Principal Cities of U. S. & Canada

When inquiring check CP 2697 on handy form, pgs. 2-3

What do You Need?

Order direct—get catalog and prices

"Metalsmiths" Stainless Steel and Monel Utensils

Prompt shipment —anywhere!

We've shipped "Metalsmiths" corrosion-resistant utensils all over the world for more than 30 years, with utmost satisfaction. Highest quality materials and workmanship assure long wear. All items shown, plus beakers, stock pots, batch cans and shovels, in stock. Buy, try, compare!

WRITE FOR LATEST CATALOG — PRICE LIST

METALSMITH
Division of **Orange Roller Bearing Co., Inc.**
556 White Street · Orange, N. J.

When inquiring check CP 2698 on handy form, pgs. 2-3

mazingly rigid, manufacturer reports. A 5/32" hole djacent to each finger permits fastening to flat surfaces with nails or screws.

Development of A. J. Gerrard & Co., Dept. CP, 1950 Hawthorne Ave., Melrose Park, Ill. . . . or for more information check CP 2699 on handy form, pages 2 and 3.)

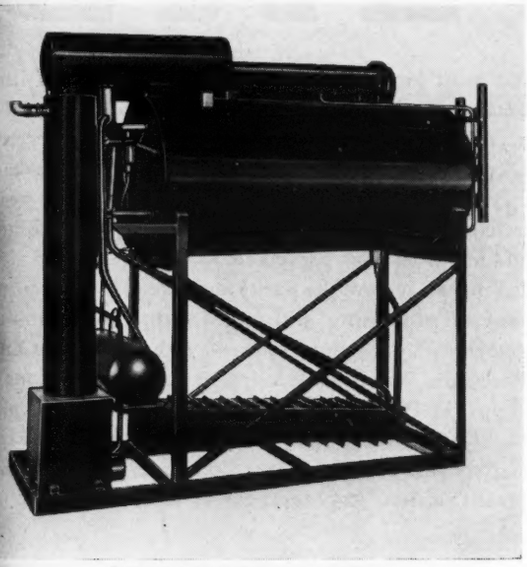
Provides economical source of chilled water for variety of uses . . .

no moving parts in unit which utilizes water as refrigerant and steam as energy source

Uses: Air conditioning; supplying refrigerated water for industrial processes, as in cooling equipment for rubber manufacture; and precooling of air for air compressors and internal combustion engines.

Features: There are no moving parts which means that unit may operate continuously at peak performance without loss of capacity and with little maintenance.

Description: Model DUT is a hermetically-sealed refrigeration unit that uses water as the refrigerant, lithium bromide as the absorbent, and steam as the energy source. Rating is 25 tons under the following standard ASRE conditions: condensing water inlet at 75°F and chilled water delivered at 40°F. At this



Water chiller has no moving parts

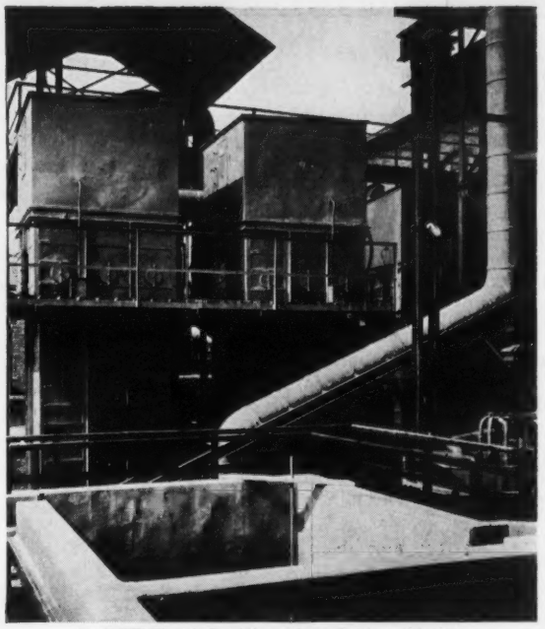
capacity, unit produces chilled water at any desired rate from 42 to 70 gpm. Steam input for this rating is 450,000 Btu (464 lb) per hour.

Chiller may be operated by steam from any source – making for economy in operation. It utilizes steam at atmospheric pressure, but steam at any pressure can be used, of course, with the proper reduction system. Entire unit operates under vacuum eliminating hazard of pressure.

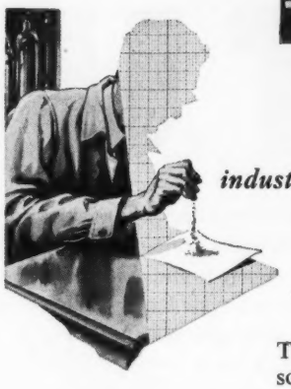
Model DUT is 30" wide, 89¼" long, and 83½" high, and has a net weight of 2500 lb. Its design permits multiple installations for large tonnage applications. service connection points are at the ends of the unit.

(Manufactured by Servel Inc., Dept. CP, Evansville 20, Ind. . . . or for more information check CP 2700 on handy form, pages 2 and 3.)

Valuable dust recovery should pay its own way



Buell 'SF' Electric Precipitator for collecting acid mist.



A Buell industrial 'dust' man can show you how valuable dust recovery actually pays for itself in profits and plant efficiency.

The Buell organization of industrial 'dust' men is devoted solely to the design and construction of dust recovery and dust collection equipment that will most efficiently and economically solve your plant's specific stack dust problem.

For more than 18 years we have been doing just this for all American industry. Every Buell installation is a custom designed system, engineered to hold stack dust discharge down to the practical limits which assure new profits, improved product and/or process, better plant-community relations, higher levels of employee morale.

For full information about Buell's ***3 basic systems*** of dust collection, and how one can be applied to the solution of your stack dust problems, write today. Ask for the new informative bulletin titled, "The Collection and Recovery of Industrial Dusts." Do it now. Buell Engineering Co., Dept. 11-E, 70 Pine Street, New York 5, N. Y.

ELECTRIC CYCLONIC ®

HIGH EFFICIENCY CYCLONES • ELECTRIC PRECIPITATORS
TYPE 'LR' COLLECTORS • LOW DRAFT LOSS COLLECTORS
SPECIAL PURPOSE COLLECTORS • DUST HOPPER VALVES

buell

ENGINEERED EFFICIENCY IN DUST RECOVERY

When inquiring check CP 2701 on handy form, pgs. 2-3

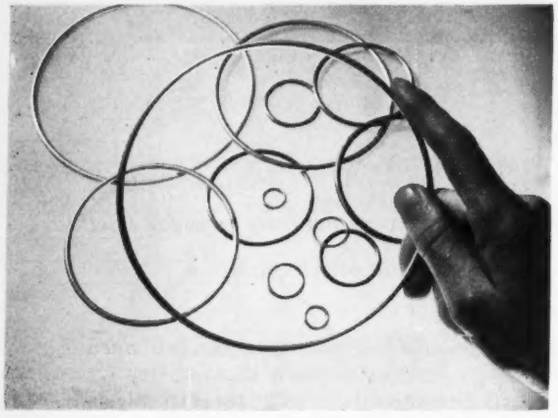
Perfect pressure, vacuum seal reported for gas-filled metal O-ring . . .

seal gets tighter as temperature rises; ring can be kept in service after several joint breakings

Uses: For static sealing applications involving vacuum, or pressures up to 20,000 psi. Several years of use in England have shown ring's success in such applications as cylinder heads, hydraulic lines, vacuum equipment, all types of fuel and exhaust systems, and high-compression diesel engines.

Features: Tightness of seal increases as temperature rises because of expansion of inert gas inside the hollow-tube ring. Standard rings are made of stainless steel, or of mild steel that is plated with cadmium or nickel. Rings have stood temperatures above 1000°F at 250 psi. If installed carefully the same ring can be used several times without loss of sealing ability, an important consideration if it is necessary to break the joint rather frequently.

Description: UAP/Wills metallic O-rings are hollow-metal-tubing rings filled with inert gas at 600 psi. They



Here are some sizes in which gas-filled sealing ring is made

can be installed in present ring grooves, in free machined recesses, or can be installed without grooves or recesses if a special compression limiting device is incorporated in the ring.

Standard rings are available in experimental quantities, in sizes ranging from 11/16 to 40" OD in increments of 1/16"; special rings have been made as small as ½" diam and as large as 66" diam. Production equipment is now being installed, and the rings should be generally available in the near future.

(Product of United Aircraft Products, Inc., Dept. CP, 1160 Bolander Ave., Dayton, Ohio . . . or for more information check CP 2702 on handy form, pages 2 and 3.)

Upright cabinet hangs prints up to 27 x 39" along suspension rods . . .

index file guides location of any one of 1000 charts, blueprints, drawings, etc

Uses: Safe and orderly storage of large blueprints, plans, photostats, X-rays, etc.

Features: Front panel of cabinet opens to accommodate over 1000 prints in sizes up to 27 x 39".

Description: Steel-constructed cabinet is 20 x 27 x 39". Hangers have two punched holes and are attached to prints.

THE PURITY AND CORROSION RESISTANCE OF SOLID PORCELAIN . . . THE OPERATING SECURITY OF FIBERGLASS-REINFORCED PLASTIC ARMOR

Lapp TUFCLAD

For problems involving severe corrosion or freedom from metallic contamination, the chemical processing industry has found no more effective—or economical—material than Lapp Chemical Porcelain. Now this same solid porcelain material is available with TUFCLAD, a new *tough* armor which greatly adds to operating security—protection of personnel and equipment—certainty of avoiding product loss.

TUFCLAD is woven Fiberglass fabric, impregnated and bonded in multiple layers to the porcelain body with a special modified phenolic resin of high strength and chemical and heat resistance. Armor is tightly knit to porcelain and runs end-to-end, *under* flanges.

In operation, TUFCLAD provides a cushion to protect porcelain against accidental damage in handling or operation—and an insulator against thermal shock.

But most important, the TUFCLAD shell is of itself homogeneous and *tough*—fully able to hold operating pressures against gross leakage even though porcelain is cracked or broken. Although some telltale leakage may ensue and the plastic shell be gradually penetrated, the system can be kept under temporary control and major damage prevented.

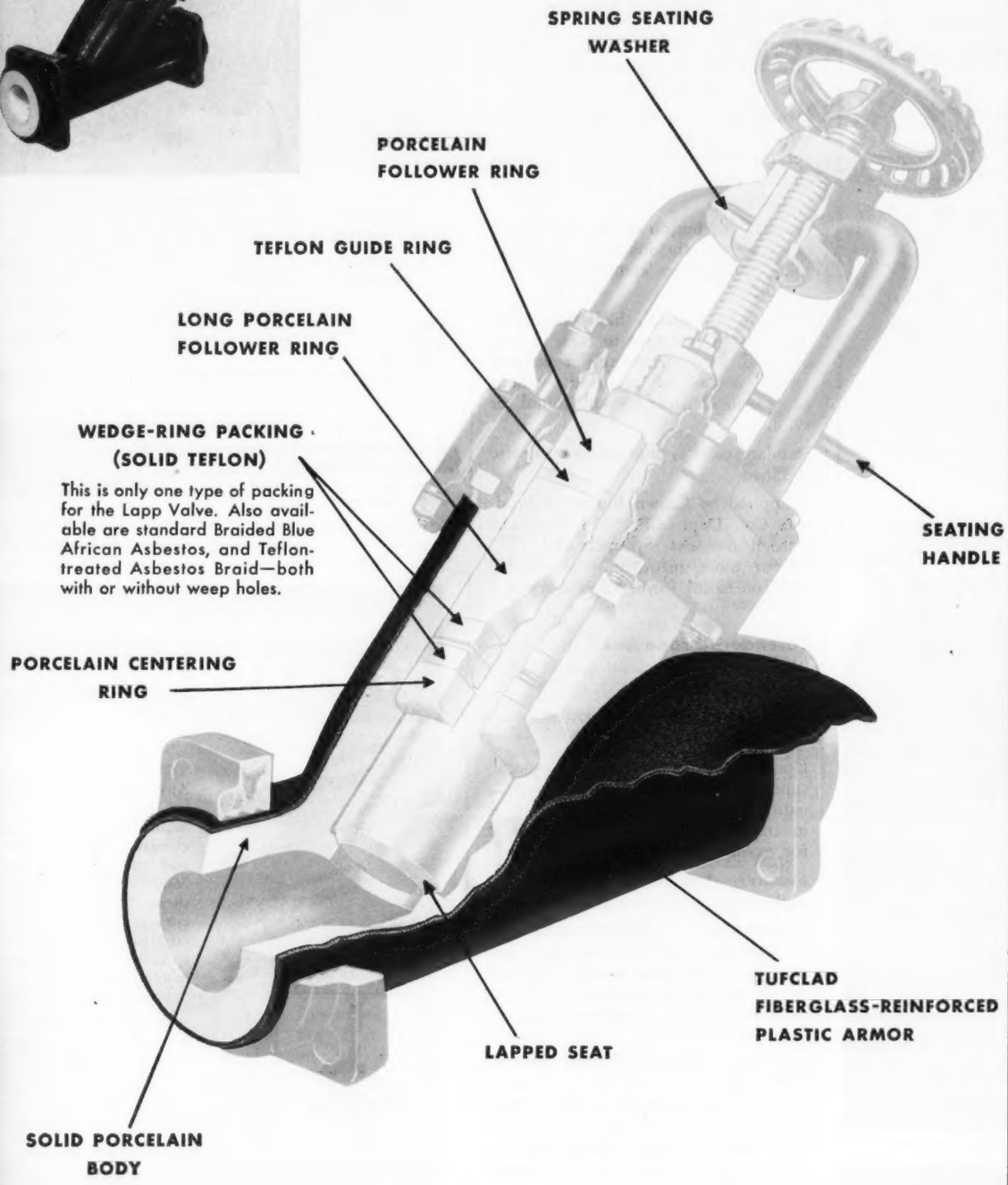
You can achieve the purity and freedom from corrosion in processing with solid Lapp porcelain—together with operating security—with Lapp TUFCLAD Porcelain. Write for description and specifications of Lapp TUFCLAD-armored Porcelain valves, plug cocks, safety valves, flush valves, pipe, fittings and special shapes. Lapp Insulator Co., Inc., Process Equipment Division, 523 Maple Street, Le Roy, N. Y.

Lapp

PROCESS EQUIPMENT

CHEMICAL PORCELAIN VALVES • PIPE • RASCHIG RINGS

PULSAFEEDER CHEMICAL PROPORTIONING PUMPS


SPRING SEATING WASHER
PORCELAIN FOLLOWER RING
TEFLON GUIDE RING
LONG PORCELAIN FOLLOWER RING
WEDGE-RING PACKING (SOLID TEFLON)
This is only one type of packing for the Lapp Valve. Also available are standard Braided Blue African Asbestos, and Teflon-treated Asbestos Braid—both with or without weep holes.
SEATING HANDLE
PORCELAIN CENTERING RING
TUFCLAD FIBERGLASS-REINFORCED PLASTIC ARMOR
LAPPED SEAT
SOLID PORCELAIN BODY

When inquiring check CP 2703 on handy form, pgs. 2-3

Manila or aluminum hangers slide along suspension rods. Manila is generally used for single print hanging, while aluminum hangers are serviceable for group filing. Index cards and lock are standard equipment. Cabinet weighs 112 lb and is available in gray, green, and office brown.

(Draw-In-Dex cabinet is product of Empire Development Corporation, Dept. CP, 15 Park Row, New York 7, N. Y. . . . or for more information check CP 2704 on handy form, pages 2 and 3.)

Non-destructive inspection for surface flaws in metals timed with production . . .

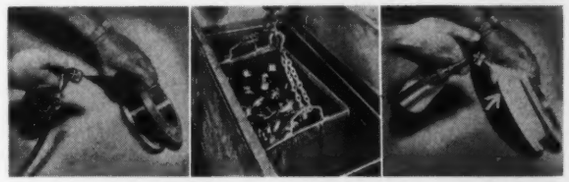
dye penetration process, besides being fast, is safe, non-toxic, and non-flammable

Development of a new, high-speed, non-destructive inspection process for locating surface flaws in metals has been announced. Chek-Spek is a partner of Dy/Chek, announced in CHEMICAL PROCESSING, Sept. 1950, pages 30 and 31. The new dye penetration process lends itself to production-line inspection, permitting an almost unlimited number of inspections per hour, maker reports.

Besides being non-toxic, Chek-Spek is also non-flammable. When used in conjunction with a vapor degreaser, it requires only two materials — Chek-Spek Penetrant (flash point 140°F) and Chek-Spek Developer (flash point 180°F). Following pre-cleaning by vapor degreaser, the red penetrant is applied to those parts being inspected.

After being allowed to dwell sufficiently long for it to enter the smallest defect that extends to the surface, the dye is removed by suspending the parts for a few seconds in the vapor zone of a vapor degreaser.

Next, the developer is sprayed onto the parts. Strong capillary attraction pulls out the dye trapped in existing



Dye penetration process for locating even the most minute surface flaws in metals can be keyed with production lines

flaws. As the developer dries to a chalk-white surface, the red dye bleeds into it, clearly locating and defining the extent of existing flaws.

Chek-Spek is applicable to both ferrous and non-ferrous metals. Whereas it is recommended to spray the developer on, it may be applied by brush or dipping.

(Turco Products, Inc., Dept. CP, 832 East 62nd Street, Los Angeles 1, Calif. . . . or for more information check CP 2705 on handy form, pages 2 and 3.)

Features of induction motors reviewed in bulletin

Construction features and types of manufacturer's large vertical induction motors widely used for pumps and other vertical drives are described in 4-page bulletin. Bulletin covers motor ratings of 40°C, 60 cps motors from 60 hp, 200 rpm to 800 hp and larger at 1800 rpm.

Bul 5B7629, is issued by Allis-Chalmers Manufacturing Co., Dept. CP, 1151 S. 70th St., Milwaukee, Wis. When quiring specify CP 2706 on handy form, pages 2 and 3.

THE SERVALL
ANGLE CENTRIFUGE
(Superspeed)

Maximum speed 13,500 r.p.m. or R.C.F. 23,000 x G. Maximum capacity 8 x 50cc

Accepted and acclaimed by scientists throughout the world for its durability, safety features, smooth performance and efficiency. Our years of experience and our pioneering of the high speed angle centrifuges guarantee their continued superiority.

Write for Booklet. . . . CH-51

One of 11 models for different volumes and speeds. Refrigerated for special purposes.

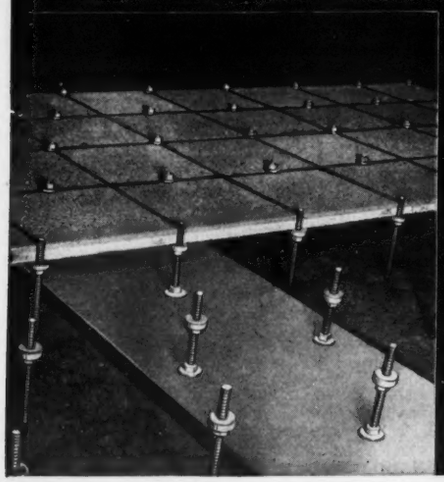
Ivan Sorvall, Inc.

210 FIFTH AVENUE, NEW YORK 10, N. Y.

When inquiring check CP 2707 on handy form, pgs. 2-3

CAMP POROUS BOTTOMS

for Rapid Sand Filters . . .



Superior to conventional filters, these porous bottoms assure improved filtration, considerably longer filter runs and ability to pass increased rate of flow. Containing no layers of graded gravel, they permit repairs and inspections to be made readily and without the heavy cost of handling the sand and gravel.

WRITE FOR BULLETIN 12S12

WALKER PROCESS EQUIPMENT INC.

PROQUIP PROCESS EQUIPMENT

FACTORY • ENGINEERING OFFICES • LABORATORY

AURORA • ILLINOIS

When inquiring check CP 2708 on handy form, pgs. 2-3

CONSTRUCTION

Dispenses layout ink in fine spray — no brushing . . .

will adhere readily, permanently to metal, wood, or glass

Uses: For making design layouts on metal, glass or wood.

Features: With aerosol container, there is no waste, spillage, or evaporation. Ink never hardens in can.

Description: By being packed in aerosol container, Crown Design Layout Ink eliminates the use of brushes and the possibility of stained clothing or hands.

Pressing the button on the top of the can dispenses the ink in a fine, even spray which dries completely in one minute.

It forms a smooth, hard, non-glare finish that is resistant to both cutting oils and heat. Although it adheres firmly, it can be removed without effort using lacquer solvent, toluol, or xylol.

Standard color is blue unless otherwise specified.

(Supplied by Crown Industrial Products Co., Dept. CP, 5073 Park and Borden Avenues, Sycamore, Ill. . . . or for more information check CP 2709 on handy form, pages 2 and 3.)

Calendered tape has high uniformity of thickness . . .

excellent chemical resistance; unusual dielectric strength

Uses: Taping operations in general; superior oil resistance makes tape a natural selection for use with oil, as in transformers or diesel equipment for example.

Features: Unusual dielectric strength; high chemical resistance.

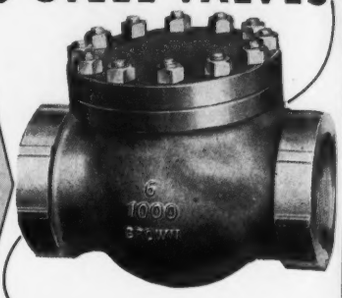
Description: Being calendered, Temflex 105 Tape possesses high uniformity of thickness — far superior to an extruded product, according to manufacturer. Uniform thickness virtually eliminates internal stresses caused by uneven tensions in the wound pad, it is claimed.

High tensile strength of this plastic tape makes its use on taping machines more effective, and although the material is not easily stretched, it possesses good ultimate elongation.

(Technical data and samples can be obtained from Irvington Varnish & Insulator Co., Dept. CP, 6 Argyle Terrace, Irvington 11, N. J. . . . or for more information check CP 2710 on handy form, pages 2 and 3.)

You Can't Beat Brown STEEL VALVES

1000-lb. W. P. HYDRAULIC CAST STEEL SWING CHECK VALVE (SCREWED TYPE) AVAILABLE IN 2", 3", 4" and 6" SIZES



...FOR PERFORMANCE

PROMPT DELIVERY

COMPLETE STOCKS

The 1000-lb. valve shown above has for many years been a favorite in the industry and is one of the leaders in the Brown line. These 1000-lb. valves are especially compact and are priced comparably to valves made for much lower working pressures. VERNON offers the complete line of Brown cast steel swing check valves for use on steam, oil, oil vapor, gas and water lines. Available in most sizes for working pressures from 150 lbs. to 2500 lbs. Also, VERNON offers prompt delivery on a complete line of globe, angle and steam throttle valves.

MAKE YOUR NEXT STEEL VALVE A BROWN VALVE

BROWN VALVE DIVISION

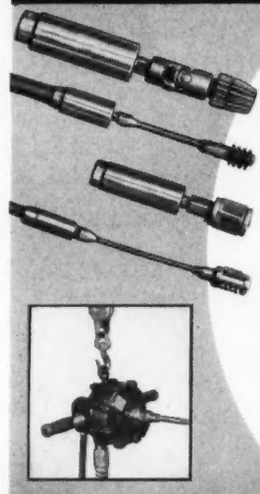
VERNON TOOL CO., LTD.

CENTRIFUGAL PUMPS • GESAND... VIBRATING SCREEN... PIPE CUTTING PANTOGRAP... STEEL VALVES • STUFFING BO...

1101 Meridian Ave., Alhambra, Calif.
6226 Washington, Houston 7, Texas

When inquiring check CP 2711 on handy form, pgs. 2-3

Cleaning small tubes is a LAGONDA job.



Anything from ½ in. ID up is duck soup for this broad line of hard-biting cutters, brushes, scrapers, and the powerful little "600" motor that drives them. They get around curves too, with short, flexible couplings and special hose of maximum inside capacity.

For straight tubes, the new Lagonda condenser tube cleaner, of suspension type with two-way ball thrust bearings and trigger control.

Write for bulletins.

ELLIOTT Company

LAGONDA DIVISION • SPRINGFIELD, OHIO

DISTRICT OFFICES IN PRINCIPAL CITIES

When inquiring check CP 2712 on handy form, pgs. 2-3

Water bath made with chemical powder puts protective coating on metals . . .

colors can also be used in treatment for purpose of identification

Uses: As a base for organic coatings or can be used by itself as a barrier to corrosion for aluminum and its alloys.

Features: Simple surface conversion treatment can be made with water in ordinary iron tank to which chemical powder has been added. The bath is easily maintained and controlled by a simple titration and end point determination.

Description: Process consists of dissolving required amount of chemical powder (normally 12-16 oz per gallon of water) in tank and operating solution at approximately 212°F. If only lightly contaminated, the work can be processed immediately; otherwise it should be cleaned with solvent degreaser or an alkali cleaner for aluminum. Time of immersion is governed by composition of the metal. (Pure aluminum requires about 5 min; alloys high in silicon or copper need 15-20 min).

Color of the processed work varies from a light iridescent gray to a heavy, dark gray, depending on the time of immersion and composition of the alloy. Solution can be dyed in a limited color range for identification and other uses. Work can be handled on iron carriers in baskets, or in rotating drums, depending on the shape and size of the pieces. Where heavy production schedules are involved, a conventional type of alkali spray washer can be used to advantage.

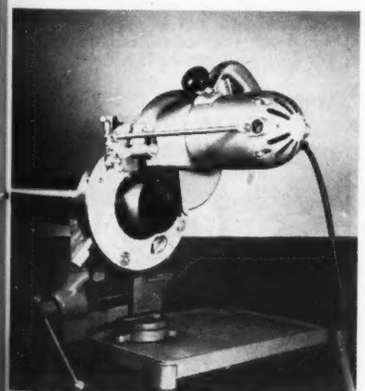
(Development of Silver Star Chemical Corp., Dept. CP, 58 Watts St., New York 13, N. Y. . . . or for more information check CP 2713 on handy form, pages 2 and 3.)

Special abrasive wheels speed cutting of metal tubes with light-weight, sturdy power saw . . .

can cut through 2½", 15 gage stainless tubing in thirty seconds

Uses: For cutting of pipe and tubing of aluminum, copper, stainless steel, etc, in varying wall thicknesses.

Features: Special heavy-duty abrasive disc cuts through metal at high speed, (cuts through 2½", 15 gage stainless tubing in thirty seconds). Saw can be secured to benches or bench vise and adjusts to any size pipe or tubing.



Light-weight cut-off saw for metal pipes and tubing

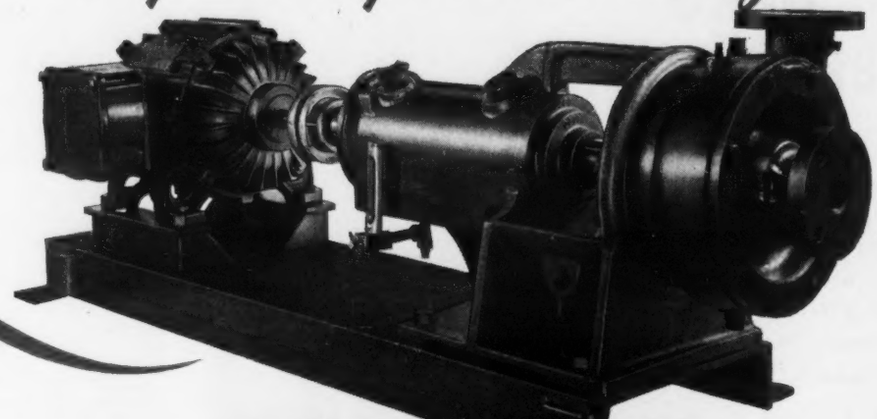
Description: Saw uses 110v AC and is designed with a free-moving, rotating frame which encompasses the piece to be cut. The cut-off saw is attached to the frame so that both frame and saw rotate together completely around pipe periphery until the cut is made.

(Product of the Tri-Clover Machine Co., Dept. CP, Kenosha, Wis. . . . or for more information check CP 2714 on handy form, pages 2 and 3.)

WHY BUY MORE PUMP THAN YOU NEED?

this standard pump can be used on many special jobs—

may save you hundreds of dollars



HERE'S A TYPICAL CASE! An Eastern chemical company has standardized on Allis-Chalmers general purpose chemical pumps. They now handle chemicals up to 500 F with pumps costing hundreds of dollars less than the pumps they used formerly.

Allis-Chalmers general purpose pump isn't meant to do *every* job in the chemical industry. On the other hand, it can't be beat on many applications and costs much less than refinery type pumps widely used in the industry. It will handle a big percentage of chemical industry jobs, for several reasons:

- It's built in most used size range . . . to 1200 gpm, 250 ft head.
- Handles liquids in most common temperature range . . . up to 500 F.
- Built in wide choice of materials. Can be provided with six different sealing arrangements, including a water cooled stuffing box . . . somewhat unusual in a pump of this type.

Another feature is the large, easily changed reservoir of oil for lubricating the bearings. Pedestal is of rigid, corrosion resistant cast iron. As you can see from the picture, there is plenty of room between pump and pedestal for easy maintenance.

ALLIS-CHALMERS General Purpose Chemical Pumps

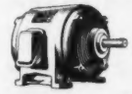
Allis-Chalmers can supply you with a complete pumping unit — pump, motor, drive, and control — all of coordinated design and manufacture and all mounted on a rigid base ready to install.

To get more information on Allis-Chalmers General Purpose Chemical Pumps, call your Allis-Chalmers Authorized Distributor or District Office. Or write Allis-Chalmers, Milwaukee 1, Wis., for Bulletin 52B7638.

A-3666

Sold . . .
Applied . . .
Serviced . . .

by Allis-Chalmers Authorized Dealers, Certified Service Shops and Sales Offices throughout the country.



MOTORS — ½ to 25,000 hp and up. All types.

CONTROL — Manual, magnetic and combination starters; push button stations and components for complete control systems.

TEXROPE — Belts in all sizes and sections, standard and *Vari-Pitch* sheaves, speed changers.

Texrope and Vari-Pitch are Allis-Chalmers trademarks.

ALLIS-CHALMERS

A-C ALLIS-CHALMERS

When inquiring check CP 2715 on handy form, pgs. 2-3

Finer Shearing for Faster Dissolving

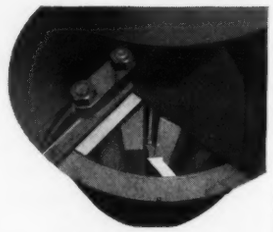
DAY

HERO RUBBER CEMENT MIXER

No ordinary equipment can match a DAY Hero Rubber Cement Mixer for fast, thorough dissolving. The reason is positive shearing action.

Four sets of stationary blades, 90 degrees apart, extend downward from the top frame. Two other sets, 180 degrees apart, extend upward and rotate with the vertical shaft. Close tolerance between stationary and rotating blades assures rapid reduction of particle size and greater exposure to solvent action.

For heavy-duty operation demanding speed and efficiency, put a DAY Hero Rubber Cement Mixer on your production line. Available in 80, 150 and 300 gallon capacity.



Here is a close-up view of the unique blade design for finer shearing and faster mixing.

DAY ... *Standard of the Chemical industry for mixing, sifting, dispersion equipment*

THE J. H. DAY COMPANY, CINCINNATI 22, OHIO
INCORPORATED

1143A Harrison Ave.

When inquiring check CP 2716 on handy form, pgs. 2-3

CONSTRUCTION & MAINTENANCE

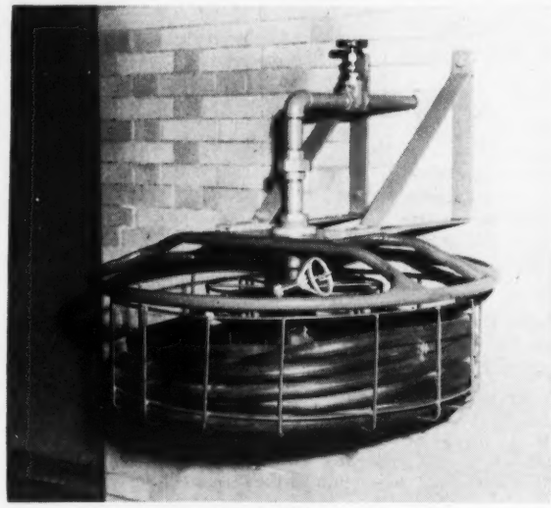
Unreeling of hose is done quickly when stored on revolving heavy wire rack . . .

compact device is designed for various sizes and in five different mountings

Uses: For handling hoses of various sizes and uses in industrial plants.

Features: Eliminates many problems of handling hoses (crimping, kinking, tangling) when hoses are used. Allows hose to be unreeled eight times as fast as by other methods.

Description: Heavy wire hose reel and fittings are designed to receive various sizes and types of hose, including water, steam, air, oil, grease, and chemical, and are available in five different models for mounting: 1) through-the-wall, 2) through-the-floor, 3) regular, 4) island, and 5) overhead. Reel operates on ball-bearings. All welds are finish ground to prevent hose damage. Permanent pipe connections are made to the spindle housing and hose connections at the end of the spindle tube. Spindle is self-sealing; there are no take-up adjustments required for the prevention of leakage. No special tools are needed for installation.



For compact storage, quick unreeling of hose

(Product of the Zierden Company, Dept. CP, Milwaukee, Wis., or for more information check CP 2717 on handy form, pages 2 and 3.

Increases life of pump packing and eliminates leakages . . .

fabricated brass cup expanders are highly impervious to brine, gasoline, and alcohol

Uses: To eliminate leakages in hydraulic and pneumatic cylinders. Cup expanders are recommended for use on pumps, hydraulic presses, jacks, air cylinders, feed mechanisms, lubricators, etc.

Features: Strip brass expanders insure positive sealing action of cup packings at all times by exerting controlled pressure on the packing lip so that it maintains constant contact with the cylinder wall. Thus, effective packing life is increased and leakage due to packing shrinkage is eliminated.

Description: Available in sizes for use with all standard hydraulic and pneumatic diameters from 1¼ to 2⅞", the

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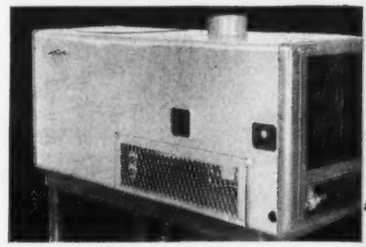
HEAT-RESISTANT FINISH

**A PRODUCT OF THE SILICONES*

1. Sicon Protects Gas Heater Combustion Chambers at 875°

2. Sicon in COLORS Preserves Appearance of Heating Equipment Indefinitely



CENTRAL GAS HEATER
Mfg'd by the JOHN ZINK CO., TULSA

For years the protection of combustion chambers and outer coverings of heating equipment has been a problem.

The John Zink Company, a leading manufacturer of gas heaters, solved this problem with SICON.

SICON protects their combustion chambers against extreme high heats of 875° without powdering or losing its color.

SICON, in attractive colors, also preserves the outside appearance of their products, adding greatly to sales appeal, and prolonging life.

The John Zink Company now uses SICON for all hot applications.

Inside and outside—SICON is the finish that can often do the job where all others fail.

WRITE FOR LATEST TECHNICAL DATA TODAY

Sicon

Silicone-Base Finish is manufactured exclusively by

MIDLAND INDUSTRIAL FINISHES CO.
Waukegan, Illinois
ENAMELS · SYNTHETICS
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When inquiring check CP 2718 on handy form pgs. 2-3

Positive

PLUG VALVE LUBRICATION

Automatically!

EVERY TIME...

... they're OPENED and CLOSED

with the **DELTA**

AUTOMATIC Plug Valve LUBRICATOR

This simple, low priced device is the mechanical brain that **always** remembers to lubricate your valves. It is the answer to a long felt need. Like the Delta Gun, Delta Fittings, and Delta-Desco Lubricants—it is another **first** developed by the Delta Plug Valve Lubricating Specialists. Write for Lubricator Catalog 15-0.

With the DELTA High Pressure GUN and DESCO Specialized Lubricants and Fittings

you can lubricate 10 to 15 valves in the same time usually required to service one with conventional jack screw.

The Only Complete Plug Valve Lubrication Company 3

DELTA-DESCO SYSTEM

DELTA

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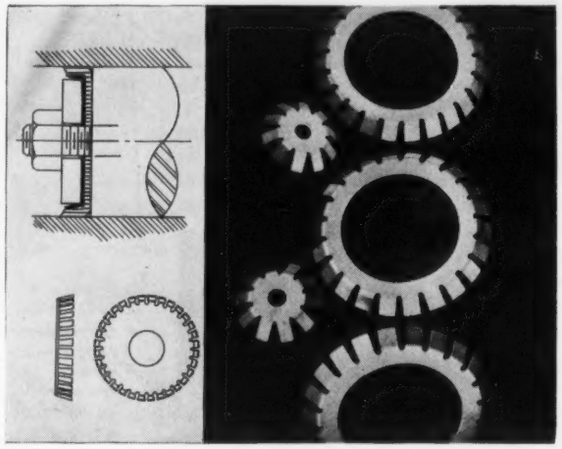
SHREVEPORT, LOUISIANA, U. S. A.

Sales Offices in All Principal Cities

When inquiring check CP 2719 on handy form, pgs. 2-3

CONSTRUCTION & MAINTENANCE

series ES-11 cup expanders are fabricated from 0.010" thick specially rolled strip brass and are highly impervious to brine, gasoline and alcohol. They can be quickly and easily installed and eliminate the need for special adapters or design changes on clamping plates or other parts. Cup



expanders will not increase wear or friction on packings because the controlled pressure is only great enough to properly support the packing.

(Product of the HPL Manufacturing Company, Dept. CP, 15145 Miles Ave., Cleveland 28, Ohio . . . or for more information check CP 2720 on handy form, pages 2 and 3.)

Guns, nozzles, and accessories for spraying viscous materials

Twelve-page bulletin reviews line of spray accessories for washing and cleaning operations as well as spraying viscous materials. Assortment of spray guns and nozzles are illustrated and charts specify capacities in gpm. Featured item is multi-spray manifold, which may have 2, 3, 4, 6, and 8 nozzles. Hard-center nozzle caps are said to maintain uniform pressure and pattern at each nozzle. Fog-type nozzles yield uniform dispersion of atomized spray particles. Full-drive nozzles provide an efficient driving spray with greater capacity.

High pressure hose, couplings, hose reels, and strainers are also described in two-color bulletin. "Industrial Spray Accesories" is issued by John Bean Division, Food Machinery and Chemical Corporation, Dept. CP, Lansing 4, Mich. When inquiring specify CP 2721 on handy form, pages 2 and 3.

Ring packing withstands pressure to 15,000 psi without extrusion

Eight-page catalog tabulates ring packing specifications for piston and rod type seals. Rings are intended for use in hydraulic and pneumatic cylinders, valves, welding machines, etc. Seals may be used where there is a constant or impulsed pressure up to 15,000 psi. Packing material is formed from synthetic rubber and serviceable in a temperature range from −70 to 250°F. Radially expanding flange prevents extrusion of packing between mating parts.

Sectional illustrations supplement descriptive material regarding installation and operational features. Bul MP-68 is issued by Greene, Tweed & Co., Dept. CP, North Wales, Pa. When inquiring specify CP 2722 on handy form, pages 2 and 3.

IT TAKES ALL FOUR...

to give you a full measure of mixing efficiency

- UNIQUE BOWL DESIGN
- CLOSE TOLERANCES
- HEAVY DUTY CONSTRUCTION
- VACUUM OPERATION

Readco's UNIQUE BOWL DESIGN provides a greater ratio of effective mixing surface to the volume of material, giving you a rapid, thorough mix.

Readco's CLOSE TOLERANCES between the spiral ribbon mixing blades and bowl eliminate build-up of materials, enabling you to attain maximum heat transfer.

Readco's HEAVY DUTY CONSTRUCTION allows you to maintain the most severe production schedules with a minimum of down time.

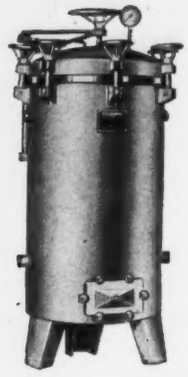
Readco's VACUUM OPERATION enables you to avoid undesirable oxidation; to recover solvents and evaporate moisture without detrimental temperatures.

READ STANDARD CORPORATION

Bakery-Chemical Division: YORK, PENNSYLVANIA—LOS ANGELES 39, CALIFORNIA

When inquiring check CP 2723 on handy form, pgs. 2-3

FOR CLEARER, BRIGHTER FILTRATE



Choose **BOWSER DIATOMITE FILTRATION**

Bowser filters are available in a wide variety of types, sizes and constructions to handle a broad range of liquid processing requirements. They provide the RIGHT answer wherever clear, bright filtrates are important.

We may have the solution to some of your filtering jobs. May we send complete information?

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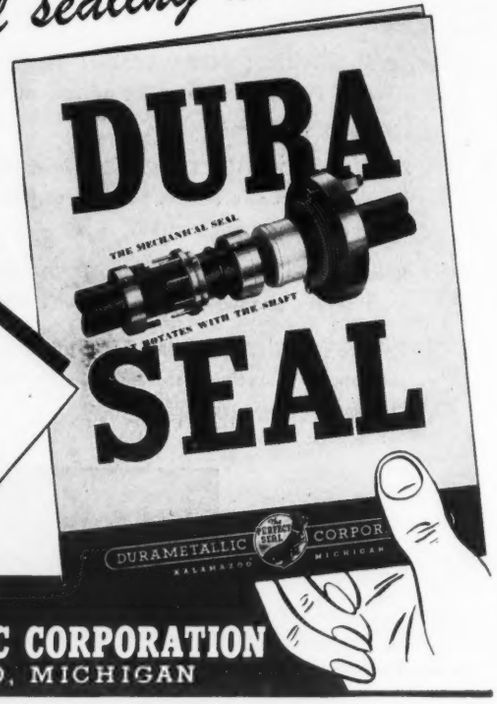
When inquiring check CP 2724 on handy form, pgs. 2-3

DURA SEAL means *mechanical sealing at its best!*

The ultimate seal for chemical processing equipment



Write for YOUR FREE COPY OF BULLETIN NO. DSCP *today!*

Address...
DURAMETALLIC CORPORATION
KALAMAZOO, MICHIGAN

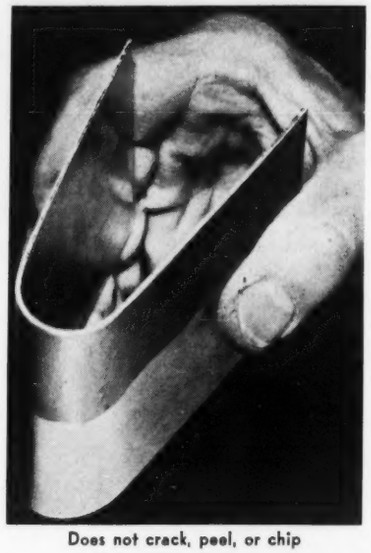
When inquiring check CP 2725 on handy form, pgs. 2-3

CONSTRUCTION

At sub-zero or 400°F, flexible coating won't crack . . .

resists chlorinated or paint solvents and vegetable oils

Protective coating called Leak Lock employs a specially made plastic that is effective against temperatures from sub-zero to 400°F. Coating may be used to protect process equipment, piping, tanks, fittings, etc, against a wide variety of chemicals such as chlorinated or paint solvents and vegetable oils. Requiring no curing,



Does not crack, peel, or chip

coating has smooth, glossy finish and retains great flexibility when air dried. Is impervious to scratches of blows, and may be applied by brush, dip, or spray.

(Product of Highside Chemicals Co., Dept. CP, 10 Colfax Ave., Clifton, N. J. . . . or for more information check CP 2726 on handy form, pages 2 and 3.)

Describes expansion of lube oil plant

Thirty-one photos and visuals are used in this 16-page brochure to describe expansion of oil refinery in both US and abroad. Highlighted in the publication is the new office in Houston, Tex. Separate sections picture and describe each branch office, affiliate, laboratory, and manufacturing arm of the world-wide firm. Text outlines scope of work performed by each, with photos of plants as illustrations.

"Meet the Lummus Company" is issued by the Lummus Company, Dept. CP, 385 Madison Ave., New York 17, N. Y. When inquiring specify CP 2727 on handy form, pages 2 and 3.

WHEN IT'S A QUESTION OF
Cutting • Shredding • Grinding • Sizing . . .

Paper
Plastic Scrap
Asbestos
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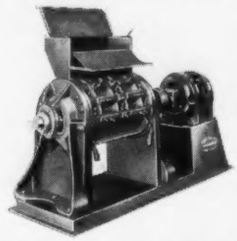
Bones
Wood Chips
Cardboard
Spices
Chicle
Licorice
Crab Shells
Leather Scrap
Drugs
Gums
Feathers
Fur
and Similar Materials

Use the Abbé Rotary Cutter



- Minimum "fines"
- More uniform product
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- Perfect shearing action
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- Quick change screens for various mesh requirements
- Any needed material of construction

Also available in laboratory sizes.
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ABBÉ ENGINEERING CO. 46 CHURCH STREET NEW YORK 7, N. Y.
Makers of
ABBÉ ENGINEERING Ball, Pebble and Jar Mills

When inquiring check CP 2728 on handy form, pgs. 2-3

An Investment In $afety...

Pat. 2188741 2526290

Exclusive scroll effect design, built in assures you of efficient performance against normally encountered static pressures.

Air-Vans are weatherproof and self contained — shipped to your job site completely assembled, ready to install. You get all the economies of direct connection in a superb low silhouette unit. Air Vans have been built to a standard of rugged dependability. Compare Air-Van material specifications and you'll see the difference.

For catalog Write Dept. C
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Performance Ratings CERTIFIED by an independent laboratory.
Cap: 150-11,000 CFM: Static Pressures to 1¾".

The GALLAHER Company
Omaha, Nebr. Owatonna, Minn.

When inquiring check CP 2729 on handy form, pgs. 2-3

New Literature

Catalogs science literature on the market

Publications pertinent to chemistry, engineering, and physics have been itemized in 36-page booklet. Books are sorted according to respective fields, and table of contents is included for each publication. Catalog also includes subject and author indexes to simplify location of particular items. Among topics listed are surface chemistry, radioactivity in inorganic chemistry, advances in X-ray analysis, plastics and resins, industrial research, etc.

Several reference manuals are offered, including a chemical formulary of nine volumes. This set contains thousands of formulas and information as to quality of each ingredient, processing procedure, and production of final industrial product. "Technical and Scientific Books" is issued by Chemical Publishing Co., Inc., Dept. CP, 212 Fifth Ave., New York 10, N. Y. When inquiring specify CP 2730 on handy form, pages 2 and 3.

Tells $150,000,000 a year savings using activated carbon

Theme of 15-page bulletin is the use of activated carbon in solvent recovery plants. Estimated recovery is two billion pounds of solvents — worth approximately 150 million dollars. Diagrams show: a typical solvent recovery unit and use of activated carbon in air circulating systems.

Descriptive material relates how activated carbon was applied and what it did in the following types of manufacturing operations: rayon, explosives, newspaper publishing, and rubber. Photographs detail some of these aforementioned installations and also typical grades of carbon. "How 7 Industries Saved $150,000,000 a Year with Columbia Activated Carbon" is issued by Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp., Dept. CP, 30 East 42nd St., New York 17, N. Y. When inquiring specify CP 2731 on handy form, pages 2 and 3.

Parade of gears and clutches takes historical slant

Switch from "muscles to machines" is background theme of 24-page booklet on clutches and hydraulic drives. Introductory pages point to replacement of manpower with machine power in past 100 years. Booklet continues with picture parade of machinery currently used in basic industries. Equipment from manufacturing and processing, fuels, metals, and mining industries is featured. Exact gear or clutch mechanism used in each machine is specified.

Photographs show equipment such as cranes, pumps, motors, diesel engines, trucks, drills, mixers, etc in actual operation. Brief description emphasizes variety of uses to which industrial friction and hydraulic drives are being applied. Two-color booklet concludes with summary of technical features of hydraulic drives, couplings, gears, and clutches. "Production Road — Basic Industries Issue" is issued by Twin Disc Clutch Co., Dept. CP, 1361 Racine St., Racine, Wis. When inquiring specify CP 2732 on handy form, pages 2 and 3.

Interprets patent right in terms of national economy

Initial chapters of 211-page book discuss present concept of patent right in United States. Preliminary questions as to application, duration, examination, and publication are reviewed in relation to established procedures in foreign countries. Court rulings and excerpts are included as means of clarifying current situation in United States. Author treats patent subject from social, economic, and legal point of view. Critical problems of shelving patents or cross-licensing to obtain a monopoly are discussed.

Book interprets background which has caused US Supreme Court to void patents in 80% of cases reviewed in recent years. Interesting feature of book is comparison of patent right in United States with that of Soviet Union. Russia is only government granting patent right in form of monetary reward as against monopoly reward. Book reports extensively on inventions and motivating forces behind them. Implication and effects of "trade secrets" are treated briefly.

Book is concluded with survey of advantages of patent system. Appendices treat topics such as the development of inventions in time of war and offer contrasting curves of population and patent grants. To obtain "The Patent Right in the National Economy of the United States" remit $5.00 direct to Central Book Company, Inc., Dept. CP, 261 Broadway, New York 7, N. Y. When inquiring specify CP 2733 on handy form, pages 2 and 3.

Technical data on morpholine

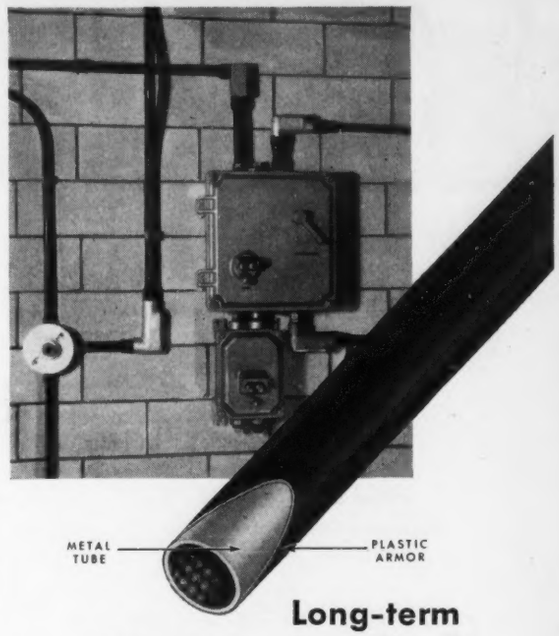
Characteristics, uses, and toxicological information on this concern's morpholine are highlighted in a new 14-page technical data booklet. Five pages of charts present data on vapor pressure, specific gravity, other pertinent physical values. "Morpholine" is issued by The Dow Chemical Company, Midland, Michigan. When inquiring specify 2734 on handy form, pages 2 and 3.

Features totally enclosed motors in power drive review

Twenty-page catalog describes electric power drives in low, normal, and variable speeds. Sectional and cutaway illustrations provide clear view of totally enclosed, fan-cooled motors. Design features give protection from foreign materials as well as dripping or splashing liquids. Direct-through ventilating system may utilize internal and external cooling or a pipe ventilating system.

Two-color catalog emphasizes variable speed power drive, which incorporates ventilating and versatile mounting features of the other motors. Variable model provides positive pulley adjustment for proportioning tension to load as well as automatic and remote speed controls. "Sterling Electric Power Drives" is issued by Sterling Electric Motors, Inc., Dept. CP, 5401 Anaheim-Telegraph Rd., Los Angeles 22, Calif. When inquiring specify CP 2735 on handy form, pages 2 and 3.

Readers of CHEMICAL PROCESSING are invited to submit concise briefs of their processing problems. With your permission these will be published (anonymously, if desired). We will place you in contact with any of the 33,000 people receiving CP who offer a solution.



Long-term answer to short-lived conduit installations...

REPUBLIC "Dekoron-Coated"

ELECTRUNITE E. M. T.

Put *new* ELECTRUNITE "Dekoron-Coated" E. M. T. (Electric Metallic Tubing) in your toughest, most corrosive areas . . . you can practically forget about replacing it.

A tough plastic armor protects the light-and-strong rigid steel raceway from attack by most all chemicals and fumes. Plastic in tape-form is used to wrap the compression couplings for true end-to-end protection of runs.

Write for Bulletin DEK-1 . . . it gives complete information about ELECTRUNITE "Dekoron-Coated" E.M.T. . . . the steel raceway that's tougher than your toughest atmosphere.

REPUBLIC STEEL CORPORATION
STEEL AND TUBES DIVISION
224 EAST 131st STREET • CLEVELAND 8, OHIO

Republic REPUBLIC STEEL
ELECTRUNITE
"Dekoron-Coated" E. M. T.
LIGHTWEIGHT THREADLESS RIGID STEEL RACEWAY

When inquiring check CP 2736 on handy form, pgs. 2-3

Processing and Engineering Data

Gasoline Vapor Content of Air in a Tank

By GEORGE E. MAPSTONE

Commonwealth Scientific and Industrial Research Organization, Chatswood, New South Wales, Australia

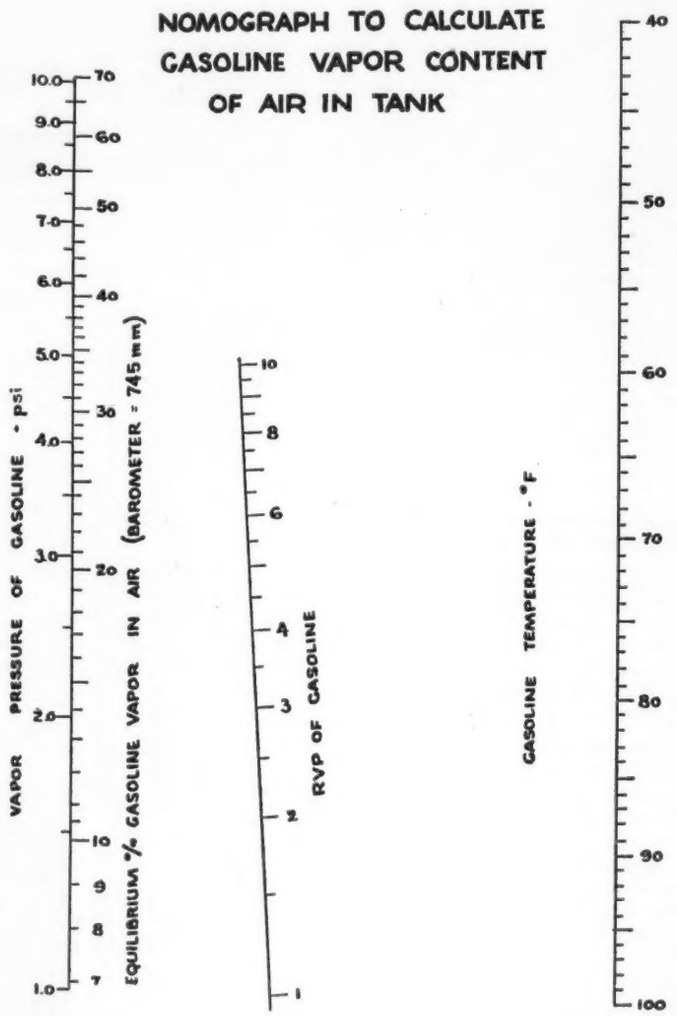
Edited by D. S. DAVIS

Professor of Chemical Engineering
Virginia Polytechnic Institute

GASOLINE is a volatile liquid that will evaporate on storage until the air above the liquid is saturated. The accompanying nomograph is designed to calculate the vapor pressure of the gasoline at any temperature from 40° to 100°F from the relative vapor pressure (R.V.P.) on the basis of the empirical vapor pressure-temperature relationships previously given (1). Similarly, the equilibrium vapor content of gasoline in air at a total pressure of 745 mm of mercury can be readily estimated from the relative vapor pressure and the temperature.

Since one needs frequently to determine the amount of gasoline vapor in the air in storage tanks where the total pressure is the normal barometric pressure, the axis for the vapor pressure of the gasoline has been alternatively scaled in the equilibrium percentage of gasoline vapor in air at a barometric pressure of 745 mm of mercury, which corresponds approximately to an altitude of 500 feet above sea level. For other mean barometric pressures the scale for equilibrium vapor content of gasoline can easily be redrawn (760 mm of mercury=14.7 psi).

The use of the chart is illustrated as follows: What are the vapor pressure of gasoline and the equilibrium vapor content in a storage tank at 87°F under a barometric pressure of 745 mm of mercury when the relative vapor pressure is 4.5? Connect 87°F at the right with 4.5 on the R. V. P. scale by means of a straightedge and read the desired values on the double scale at the left as 3.5 psi and 24%.


NOMOGRAPH TO CALCULATE GASOLINE VAPOR CONTENT OF AIR IN TANK
VAPOR PRESSURE OF GASOLINE - psi
EQUILIBRIUM % GASOLINE VAPOR IN AIR (BAROMETER = 745 mm)
RVP OF GASOLINE
GASOLINE TEMPERATURE - °F

Literature Cited (1) Mapstone, G. E., Petroleum Refiner, *30*, 157-159 (1951).

Five of the Clarage Heavy Duty Fans in the air conditioning systems of The Upjohn Company's new plant in Kalamazoo. Korfund Twin Rail Fan and Motor bases were used to prevent vibration and noise transmission into the supporting steel deck and the duct work.

...by installing over 200 fans and motors on Duplex bases

Upjohn has long been known for extreme care in the production of fine pharmaceuticals. Therefore, in building their new plant, quiet, spotless working conditions were a prime consideration. This called for 120 complete air conditioning systems with 324 Clarage Heavy Duty fans.

To conserve floor space, The Austin Company, Engineers and Builders planned the installation on suspended platforms and structural steel members under the roof.

Korfund Twin Rail Bases were specified so that no vibration or noise could reach the working areas through the steel decks or through the ducts, and to simplify the installation.

Complete adjustability of the Duplex Twin Rail separate bases for fan and motor made it easy to take care of variations in drive center distances, motor positions and other variables; and the exclusive built-in chocks in these bases guaranteed permanent alignment.

For installation of fans, pumps, compressors, refrigerating and other types of mechanical equipment for both normal and critical operating conditions, basic isolation recommendations are given in Korfund Bulletin G-104. See Sweet's Catalog Files, or write for your free copy today.

If you have a problem, we will be glad to submit recommendations without obligation. A half century of experience is at your disposal. Representatives in principal cities.

THE KORFUND COMPANY, INC

KORFUND VIBRATION CONTROL — SPRINGS — RUBBER — CORK

48-13E Thirty Second Place, Long Island City 1, N.Y.
In Canada: 2040 Victoria St., Montreal 2

When inquiring check CP 2737 on handy form, pgs. 2-3

Ion exchange to metal plating in vol 8 of chem encyclopedia

Latest member of "Encyclopedia of Chemical Technology" is number 8 in the series of volumes which are appearing at seven-month intervals. According to this time schedule and length of treatment given items in alphabetical range of various volumes, we may expect final number to appear about three years hence. Not too long to wait if you are already a subscriber and are finding the material to be a valuable adjunct to your chemical library — as it will no doubt prove to be when assembled in its entirety.

Necessarily, a work of this kind must be selective in choice of topics and in length of treatment accorded these items — general result being the satisfying of a wide range of interests at the expense of a few special ones. For example, a discussion on lipides covers 9 pages, while one dealing with the design of laboratories fills 10 pages (including illustrations). This may adversely prejudice the biochemist but not the design engineer or member of a planning board.

Ion exchange is given 17 pages of treatment, isotopes 16 pages, while topic of literature — surveying and mechanized searching of — gets a total of 47 excellent pages.

An engineer looking for information on joints — high pressure and such — will not find it here but perhaps will in a later volume under piping. In the 46-page section on lubricants and lubrication is included an interesting table on the functional properties of various synthetic oils and a chart on the miscibility relations of various lubricants and their individual compatibility with water. An excellent summary is accorded lignin — the raw material of great supply and relatively unexplored potential.

Among other subjects covered in the range between ion exchange and metal plating are: iron, ketones, lactic acid, laundering, lead and lead compounds, leather and tanning, lime and limestone, linoleum, low-temperature technique, luminescent materials, magnesium and its compounds, malts and malting, manufactured gas, mass spectrometry, metallic coatings, and metallography.

To obtain "Encyclopedia of Chemical Technology, Vol. VIII" remit $30 ($25 to holders of subscription) direct to Interscience Publishers, Inc., Dept. CP, 250 Fifth Ave., New York 1, N. Y. When inquiring specify CP 2738 on handy form, pages 2 and 3.

Surveys rubber-plastics machinery in 20 chapters

Book offers engineering information on primary machines and equipment used by rubber and plastics industries. Each chapter begins with introductory articles by recognized authorities in the field concerned. Articles discuss design trends, construction principles, and applications. Sections following offer description of machines, tables of specifications, design features, operation, and maintenance. Volume includes 341 illustrations as supplement to descriptive material.

Among subjects covered in 804-page book are extruders, compression and transfer presses, pressure vessels, dryers, heaters, molds, and special plastics machinery. Directory of 350 manufacturing firms is included with their respective machines and equipment. In addition to tables of reference data, the volume offers a list of used and rebuilt machinery suppliers. To obtain "Machinery and Equipment for Rubber Plastics, Vol. I — Primary Machinery and Equipment," remit $15.00 direct to "India Rubber World," Dept. CP, 386 Fourth Ave., New York 16, N. Y. When inquiring specify CP 2739 on handy form, pages 2 and 3.

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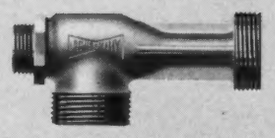

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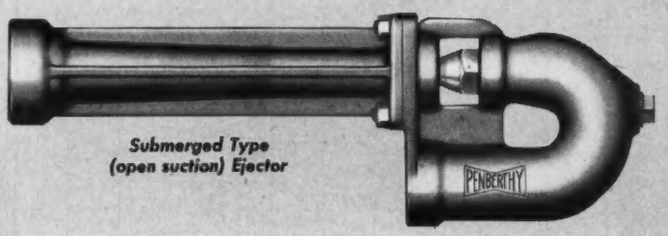

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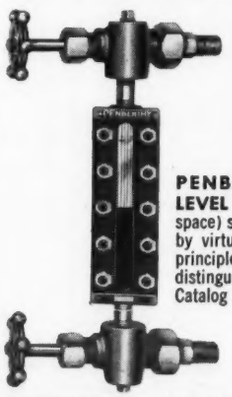

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When inquiring check CP 2740 on handy form, pgs. 2-3

Chart and Tables Aid in Selecting Transmission Belts

By NEWELL PERRY

Flat Belting Engineer, Thermoid Company, Trenton, N. J.

THE proper selection of a rubber transmission belt starts with a determination of the maximum horsepower to be handled by the belt. This is obtained by multiplying the rated horsepower of the driving unit (the name plate rating) by a service factor which represents the overload on the drive while starting. This overload varies with both type of drive unit and the type and use of the driven unit. Of course, consideration of the operating horsepower required by the driven unit has already entered into the selection of the horsepower of the driving unit.

A table of Service Factors (Table I) is offered here for equipment of the type found in chemical engineering and process industries together with a Horsepower Capacity Chart which is used to determine the horsepower delivered per inch per ply of belting.

(*Continued on page* 186)

SERVICE FACTORS

Applications	ELECTRIC MOTORS										ENGINES				
	A.C.								D.C.		Gas and Diesel				
	Squirrel Cage			Wound Rotor (Slip-Ring)	Synchronous Single Phase										Line Shafts and Clutch Starting
	Normal Torque Line Start	Normal Torque Compensator Start	High Torque		Normal Torque	High Torque	Repulsion and Split-Phase	Capacitor	Shunt Wound	Compound Wound	4 or More Cyl. Above 700 r.p.m.	4 or More Cyl. Below 700 r.p.m.	3 or Less Cyl. (Refer to Factory)	Steam	
AGITATORS—															
Paddle-Propeller															
Liquid	1.0	1.0	1.2												
Semi-Liquid	1.2	1.0	1.4	1.2											
MILLS															
Pebble		1.4	1.6	1.4						1.4					1.6
Rod		1.4	1.6	1.4						1.4					1.6
Ball		1.4	1.6	1.4						1.4					1.6
Roller Mills		1.4	1.6	1.4						1.4					1.6
Flaking Mills		1.6	1.6	1.4						1.4					1.6
Tumbling Barrels		1.6	1.6	1.4						1.4					1.6
PUMPS															
Centrifugal	1.2	1.2	1.4	1.4			1.2	1.2							
Gear	1.2	1.2	1.4	1.4			1.2	1.2							
Rotary	1.2	1.2	1.4	1.4			1.2	1.2	1.2		1.2				
Reciprocating—															
3 or more Cyl.	1.2	1.2		1.4	1.4	1.6					1.8			1.8	
1 or 2 Cyl.	1.4	1.4		1.6	1.6	1.8					2.0			2.0	
FANS AND BLOWERS															
Centrifugal	1.2	1.2		1.4					1.2		1.2				
Propeller	1.4	1.4	2.0	1.6		2.0			1.4		1.4				
Induced Draft	1.2	1.2		1.4					1.4		1.4				
Positive Displ. Blowers	1.6	1.6		2.0	2.0	2.0					1.6				
Exhausters	1.2	1.2		1.4					1.4					1.5	1.5
COMPRESSORS															
Centrifugal	1.2	1.2		1.4	1.4				1.2		1.2				
Rotary	1.2	1.2		1.4	1.4		1.2	1.2	1.2		1.2				
Reciprocating—															
3 or more Cyl.	1.2	1.2		1.4	1.4				1.2						
1 or 2 Cyl.	1.4	1.4		1.5	1.5				1.2						
LINE SHAFTS	1.4	1.4		1.4	1.4	2.0	1.4	1.4	1.4	1.4	1.6			1.6	1.6
GENERATOR AND EXCITERS	1.2								1.2		2.0			1.4	1.4

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When inquiring check CP 2741 on handy form, pgs. 2-3

Government bibliography of technical reports

Developments in metallurgy, electronics, and textiles are described in technical bibliography. Publication is composed of approximately 243 abstracts of technical reports on government research and development projects. Among topics featured in work are powder metallurgy, natural ventilation of buildings, electrostatic tube storage system, fabrication and operating characteristics of sintered thoria cathodes, static frequency transformers for small electric motors, etc.

Reports are listed from federal and foreign sources. Most of publications have not been previously publicized. Variety of fields covered are chemical, electrical machinery, instruments, metals and metal products, structural engineering and transportation equipment, etc. To obtain "Bibliography of Technical Reports" remit 50c direct to Office of Technical Services, Dept. CP, U.S. Department of Commerce, Washington 25, D.C.

Explains eight important fields of instrument use

This book is a full 8½ x 11 inches and it is printed in two colors. Its 126 pages are crammed with diagrams, drawings, and photographs of instruments.

Dealing with fundamentals of instrumentation for industry, the book is divided into nine sections. First of these is a preface concerned with background material. Main theme of the publication starts with second section, "Fundamentals of Measurement and Control." "Measurement of Process Variables" is the subject of the third section.

Remaining sections of the book deal with remote transmission of measurements, types of automatic controllers, power units and final control elements, control systems, panelboards, and typical applications. True to its purpose, the information presented never deviates from fundamentals. Such complexities as are considered are presented in the light of conventional design features and conventional instrumentation methods. Because of this, the book is a valuable reference.

Booklet 80-2 is issued by Brown Instruments Div., Minneapolis-Honeywell Regulator Co., Dept. CP, Wayne & Windrim Aves., Station 40, Philadelphia 44, Pa. When inquiring specify CP 2742 on handy form, pages 2 and 3.

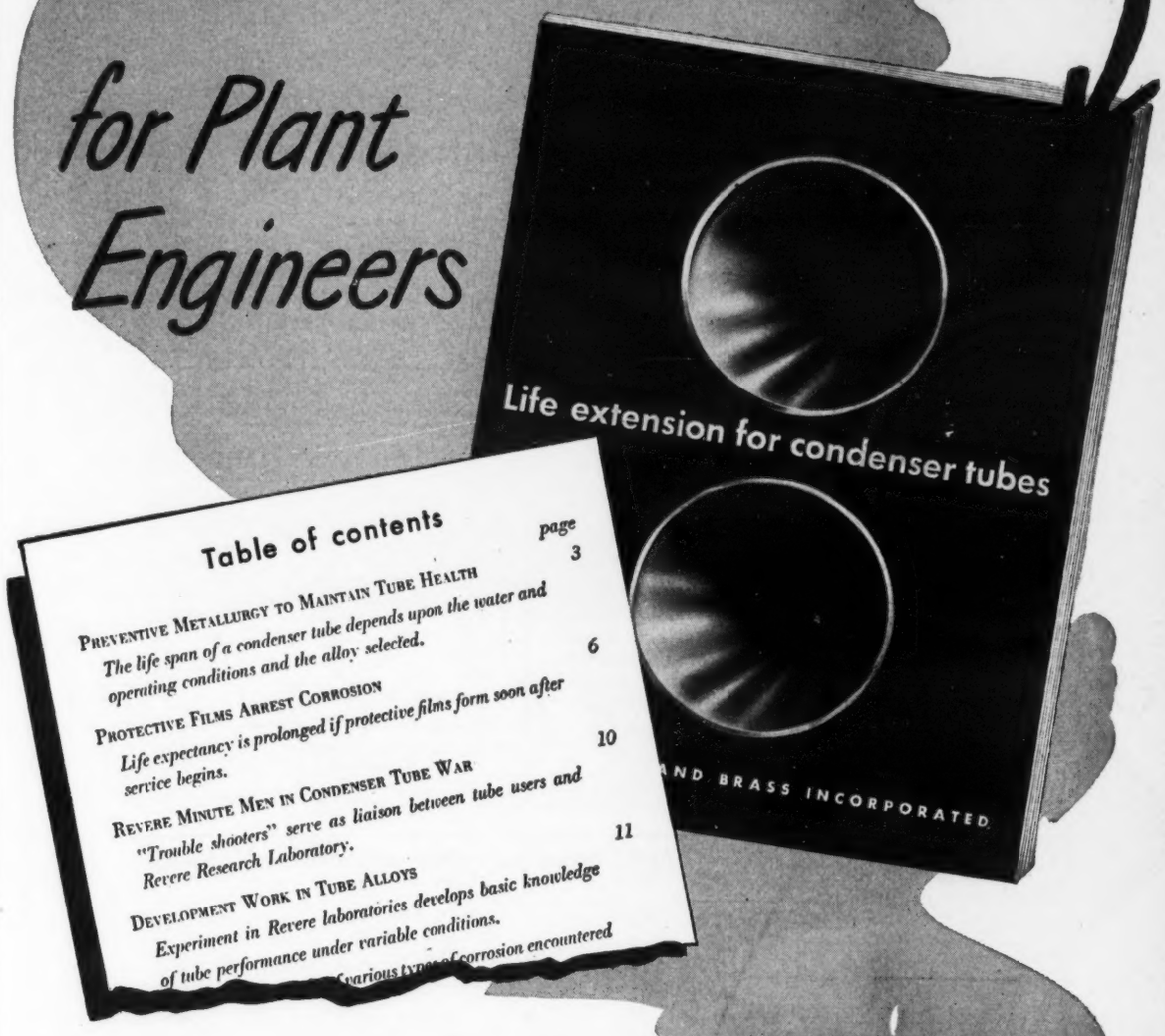
Pipeline strainers collect sediment and clean themselves

Four-page bulletin emphasizes self cleaning feature of pipeline strainers for steam traps, air tools, pumps, reducing valves, etc. Strainers are available in sizes from ¼ to 3".

Units are suitable for maximum steam operating pressures of 250 psi, and maximum temperatures of 450°F. Strainers will clean themselves when blow-down valve is used. Cleaning is also accomplished when blow-down plug is removed from the strainer and line blown clear.

Sediment control is advocated in order to protect equipment and reduce maintenance. Specifications are tabulated for strainers and cutaway illustration shows filtering action. Mesh type screens are made of stainless steel. Brass screens are available in 2½ and 3" sizes. Bul 252 is issued by The V. D. Anderson Company, Dept. CP, 1935 W. 96th St., Cleveland 2, Ohio. When inquiring specify CP 2743 on handy form, pages 2 and 3.

"MUST" Reading for Plant Engineers



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PREVENTIVE METALLURGY TO MAINTAIN TUBE HEALTH 3
The life span of a condenser tube depends upon the water and operating conditions and the alloy selected.
PROTECTIVE FILMS ARREST CORROSION 6
Life expectancy is prolonged if protective films form soon after service begins.
REVERE MINUTE MEN IN CONDENSER TUBE WAR 10
"Trouble shooters" serve as liaison between tube users and Revere Research Laboratory.
DEVELOPMENT WORK IN TUBE ALLOYS 11
Experiment in Revere laboratories develops basic knowledge of tube performance under variable conditions.
various types of corrosion encountered

• We doubt very much if you have ever read a booklet on Condenser Tubes, quite like this one.

Plant engineers should find it of unusual interest particularly with present restrictions on copper and its alloys making it more important than ever that every last ounce of use be squeezed out of the condenser tubes in their plants.

This 28-page booklet includes data on various copper alloys, photos of cut-away tube sections showing various types of corrosion encountered in condenser tube service and photomicrographs showing the grain structure of different kinds of metals under varying operating conditions.

Send for your copy today. Please make request on your firm's letterhead. Thank you. Address Department P.R., Revere Copper and Brass Incorporated, 230 Park Avenue, N. Y. 17, N. Y.

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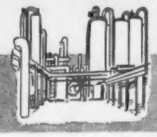
When inquiring check CP 2744 on handy form, pgs. 2-3



Processing and Engineering Data

(*Continued from page* 184)

A proper belt is described in terms of width, W, and number of plies, P. Their product, WP, which represents the ply-inch of fabric in the belt necessary to carry the load, is an important determination. This WP value is determined by dividing the chart value of horsepower per inch per ply into the total horsepower (including the starting Service Factor) involved, as in formula (1) below. Other considerations, such as the existing pulley face width and good belt proportioning (see Tables II and III) will dictate selection of actual width and corresponding number of plies required by WP product.

Any belt in the table of well-proportioned belts having the calculated WP product (or next above that calculated value) is satisfactory provided that pulley diameters are not too small. See Table II. In practice the tendency is towards the wider possible belt for the projected drive so as to obtain the thinnest possible belt for greater flex life.

The WP-product is given below:

$$(1)\quad WP = \frac{HP \times \text{Service Factor}}{hp}$$

where WP = the required Width-Ply product
HP = plate or rated horsepower of the driving unit
hp = horsepower capacity per inch per ply for the fabric selected at the belt speed and angle of belt-contact involved. It is obtained from the horsepower capacity chart

Belt speed, S, is determined as follows:

$$(2)\quad S = 0.262 \times D \times rpm$$

where S = Belt speed in feet per minute
rpm = revolutions per minute of the drive pulley
D = diameter of drive pulley in inches

Angle of belt contact is given by

$$(3)\quad A = 180^\circ - \frac{60\,(D - d)}{C}$$

where D = diameter of the larger pulley in inches
d = diameter of the smaller pulley in inches
C = center-center distance between pulley in inches

(*Continued on page* 188)

TABLE II
PULLEY DIAMETERS VERSUS BELT PLIES

Rubber Belt Fabric Weights	Silver 35 oz Hard Duck		28 and 32 oz Soft Duck	
Number of Plies	Pulley Diameters in Inches			
	Minimum	Normal	Minimum	Normal
3 ply	4"	7"	4"	6"
4 ply	6"	9"	6"	8"
5 ply	8"	12"	8"	10"
6 ply	10"	15"	10"	14"
7 ply	12"	18"	12"	16"
8 ply	14"	22"	14"	20"
9 ply	16"	26"	16"	24"
10 ply	18"	30"	18"	28"

Note: Use normal diameters for best results. Pulleys larger than normal may be used.

TABLE III — WELL PROPORTIONED RUBBER BELTING

Standard Belt-Width (in)	Minimum Plies	WP Value	Intermediate Plies	WP Value	Intermediate Plies	WP Value	Maximum Plies	WP Value
2"	3 ply	6	.....	.....	.....	.....	4 ply	8
3"	3 ply	9	4 ply	12	.....	.....	5 ply	15
4"	3 ply	12	4 ply	16	.....	.....	5 ply	20
5"	4 ply	20	.....	.....	.....	.....	5 ply	25
6"	4 ply	24	5 ply	30	.....	.....	6 ply	36
8"	4 ply	32	5 ply	40	.....	.....	6 ply	48
10"	4 ply	40	5 ply	50	.....	.....	6 ply	60
12"	5 ply	60	6 ply	72	.....	.....	7 ply	84
14"	5 ply	70	6 ply	84	.....	.....	7 ply	98
16"	5 ply	80	6 ply	96	.....	.....	7 ply	112
18"	5 ply	90	6 ply	108	7 ply	126	8 ply	144
20"	5 ply	100	6 ply	120	7 ply	140	8 ply	160
22"	5 ply	110	6 ply	132	7 ply	154	8 ply	176
24"	6 ply	144	7 ply	168	.....	.....	8 ply	192
26"	6 ply	156	7 ply	182	8 ply	208	9 ply	234
28"	6 ply	168	7 ply	196	8 ply	224	9 ply	252
30"	7 ply	210	8 ply	240	9 ply	270	10 ply	300
36"	7 ply	252	8 ply	288	9 ply	324	10 ply	360
42"	7 ply	294	8 ply	336	9 ply	378	10 ply	420
48"	7 ply	336	8 ply	384	9 ply	432	.....	.....
48"	.....	.....	10 ply	480	11 ply	528	12 ply	576

● That is the Streamline story in a nutshell. The way it works is the answer—from inlet to outlet the fluid flows through this valve in a straight line—a streamline. There is no detour around a dividing wall—the direction of the flow is not changed at right angles because of a seat wall AND the flow is not broken up by valve stems, springs, or other parts. Forget it once it's installed like others do. PROOF: "We have a large number of buildings scattered over about 100 acres of land. Just where we installed these Streamlined Valves I don't know. But I do know that I haven't seen or heard of them since they were installed"—Case No. 343. PROOF: "We installed four or five of your Streamlined Regulators. The last I heard of them they were holding pressure the same as when we first installed them. And as far as I know no one has ever touched them."—Case No. 345.

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When inquiring check CP 2745 on handy form, pgs. 2-3

Reprints symposium on structural sandwich construction

Eight papers and discussions are included in 120-page review of 1951 annual meeting of American Society for Testing Materials. Purpose of the meeting was to review materials which would insure best results in structural sandwich construction. Booklet is composed of reports delivered at symposium and includes charts, graphs, test data, and illustrations that were presented. Five papers were presented by members of US Dept. of Agriculture and the other three were specialists in their fields.

Among topics discussed were current trends in composite structural materials, which presented data on low-density core materials, adhesives, fabricating techniques, and testing or inspection methods. Problems of elastic behavior such as buckling or wrinkling of sandwich constructions were also covered. Inorganic core materials were reviewed as well as paper honeycomb and aluminum honeycomb cores for sandwich construction. Booklet includes research data and bibliographical references which were necessary in formulating these reports.

To obtain STP 118 remit $2.00 direct to American Society for Testing Materials, Dept. CP, 1916 Race St., Philadelphia 3, Pa. When inquiring specify CP 2746 on handy form, pages 2 and 3.

Performance and installation data guide selection of air diffuser

Two-color 64-page manual aids selection of correct air diffuser for use in air conditioning systems. Equipment is used in control of temperature, moisture content, motion, and distribution of air. Air diffusers feature primary (aspiration) and secondary induction characteristics in same unit. Expanding cone construction creates low pressure areas within the unit and assures internal induction. Sectional drawings, including appropriate dimensions, are also shown.

Fifteen models are reviewed in catalog which also discusses installation procedures, accessories, and units for heating, refrigeration, evaporative cooling, etc. Manual 40-1952 is issued on letterhead request to Anemostat Corporation of America, Dept. CP, 10 E. 39th St., New York 16, N. Y.

Melting crayon indicates temp range from 113 to 2000°F

One-page instruction sheet describes temperature sensitive crayons with calibrated melting points. Sixty different crayons cover range from 113 to 2000°F. Each indicates specified temperature within tolerance of plus or minus 1% of its rating. General procedure is to mark work-piece with crayon and subsequent heating causes mark to melt as soon as temperature rating is reached. Instruction sheet discusses alternative methods for gaging temperatures of rapidly moving and rotating objects.

Several industrial and research applications are suggested in addition to techniques for determining temperatures in unusual situations. Temperature distribution and isothermal boundaries of surfaces such as furnace walls, melting ladles, cement kilns, etc can be established. Heat conduction along a surface can be studied by progressive melting points of suitably chosen series of crayons. Temperature indicators are serviceable in ionized air and in induction heating.

Static electricity will not affect temperature determination. Instruction Sheet 5010 ST is issued by Tempil Corporation, Dept. CP, 11 W. 25th St., New York 11, N. Y. When inquiring specify CP 2747 on handy form, pages 2 and 3.

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When inquiring check CP 2748 on handy form, pgs. 2-3

(*Continued from page* 186)

This formula gives the smaller angle of belt contact. If an idler is used, it is safe to estimate the belt angle from position of idler on the new belt (usually 10 degrees more than calculated above).

The Horsepower Capacity Chart is based on the following formula:

$$(4)\quad hp = \frac{S\,(T_1 - T_c)\,(1 - 1/R)}{33{,}000}$$

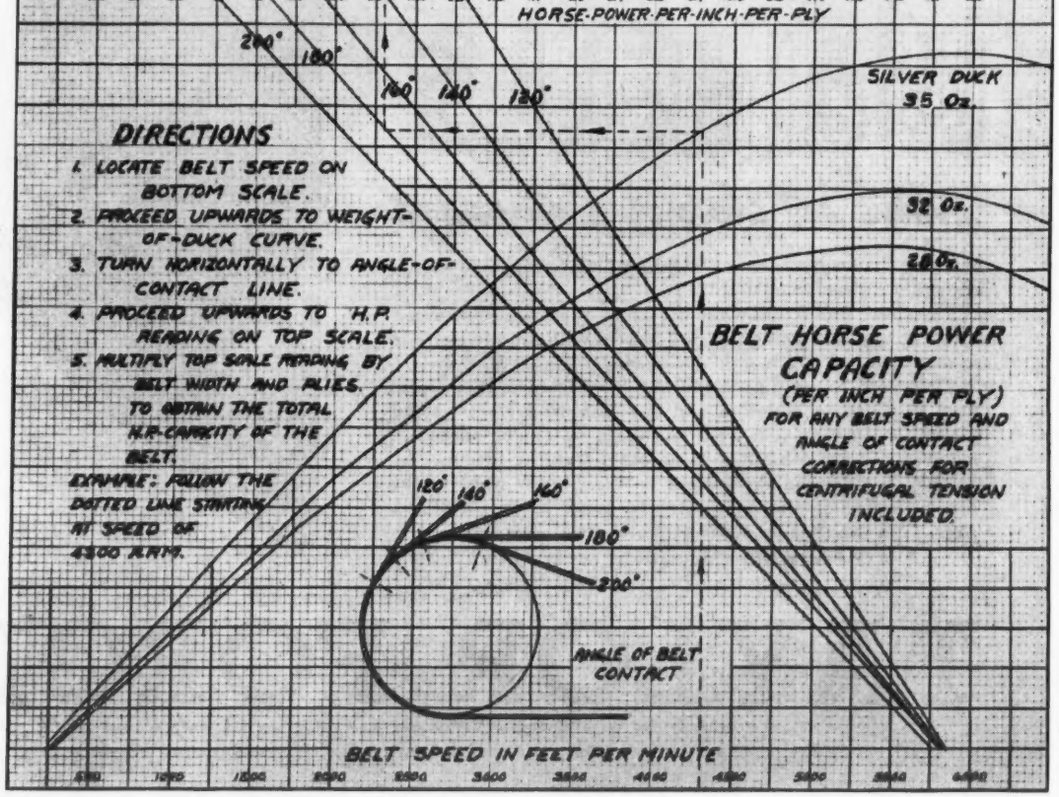
hp = horsepower capacity per inch per ply
T_1 = proper tight side tension for fabric involved, in lb
T_c = centrifugal tension in lb = $\frac{w\,S^2}{3600g}$
R = ratio of tight side to slack side tension = $e^{\mu\theta} = \frac{T_1 - T_c}{T_2 - T_c}$
W = 0.03 lb, the average weight of belting per inch per ply per foot
S = belt speed in feet per minute
g = the acceleration of gravity, 32.2 ft per second per second
e = base of Naperian logarithm = 2.71828
μ = coefficient of belt-pulley friction = 0.22 @ 180°
θ = angle of belt contact in radians
T_2 = slack side tension

This equation shows that belt horsepower depends upon and varies with speed angle of belt and coefficient of friction.

It will be noted that the three curves of 28, 32 and 35 oz fabric achieve horsepower maxima between belt speeds of 500 and 6000 feet per minute.

Normal high speed is 4000 -5500 fpm. Medium speed 3000 -4000 fpm and low speed 2500 -3000. Still lower speeds are possible but often impractical.

A belt with the proper WP product and in good proportion according to Table III should be examined for flexibility by checking plies against pulley diameters in Table II. When pulleys are below minimum in diameter, the sizes of both drive and driven pulleys should be increased unless a thinner belt of heavier fabric will suffice. The normal pulley diameters of Table II will allow maximum belt life. As the diameter gets smaller, the tendency to fatigue the rubber and fabric, resulting in "bootlegging" and splice failure, also increases. Inasmuch as tension ratios tend to be less than 2.00 as the pulley size approaches the minimum limit in Table II (due to the application of more tension than actually required to do the job), the use of minimum size entails greater installation care to obtain maximum belt life and is not as safe.



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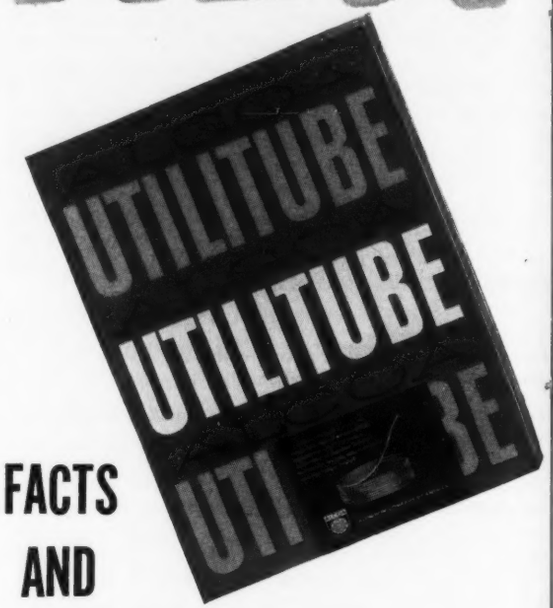

FACTS AND TECHNICAL DATA ON ALCOA'S NEW, ALL-PURPOSE COILED TUBE

Send for this new booklet describing Alcoa's new aluminum coiled tube—UTILITUBE. Alcoa UTILITUBE is designed for instrumentation, fuel, air and lubrication applications. It is easier to form, flare and bend than annealed copper. It will save you up to 40% on tube costs—gives you 3 times more feet per pound. It comes in standard 50- and 100-foot lengths and in economical, long lengths up to 1,000 feet in some sizes. And aluminum fittings are now available from leading tube fitting distributors. Write:

ALUMINUM COMPANY OF AMERICA
837-E Gulf Building • Pittsburgh 19, Pennsylvania

ALCOA

When inquiring check CP 2749 on handy form, pgs. 2-3

Practical information covers nickel plating

Basic information on electroplating and detailed material on nickel plating is presented in 44-page booklet. Description covers mechanical properties of deposits, plating conditions, and commonly used solutions. Recommendations are made for preparation of basic metals, for recognition and correction of plating difficulties, and for methods used to purify solutions. Booklet discusses thicknesses and type of nickel deposits for adequate service in several corrosion-resistant, industrial, and electroforming applications.

Several sample items are shown to illustrate "before" and "after" condition of products. Solution composition and plating conditions are tabulated for 11 separate plating agents. Tabular data also includes results of laboratory corrosion tests in Watts type plating baths and in high chloride plating baths. Keyed bibliography suggests 41 sources of additional reading material for further investigation. "Practical Nickel Plating" is issued by The International Nickel Company, Inc., Dept. CP, 67 Wall St., New York 5, N. Y. When inquiring specify CP 2750 on handy form, pages 2 and 3.

Highlights telephone systems for plant and office

Eight-page circular outlines telephone equipment designed to supplement city telephone services and solve intercommunications problems. Cutaway illustrations of plant buildings show integration of standard and auxiliary telephone systems. Eight switchboard units are shown, which are capable of servicing 10 telephones and two conversations at once to 200 telephones and any number of conversations at once. System is designed to separate load of inside calls from the volume of outside calls. Advantage of systems is said to be its quick and direct line to various departments.

Special services available with telephone system relate to public address cut-in for announcements, telephone conferences, direct line for executives to various departments, and others. Two-color bulletin discusses installation of switchboards and includes dimensions of the eight types. Circular 1735 is issued by Automatic Electric Company, Dept. CP, 1033 W. Van Buren St., Chicago 7, Ill. When inquiring specify CP 2751 on handy form, pages 2 and 3.

Itemizes science publications — foreign and domestic

Current periodicals and books of science are outlined in 64-page catalog. Brief description, table of contents, and commentary on each publication are given. Books are the work of American and foreign authors. Catalog is devoted primarily to chemical publications whose subjects range from polymers and plastics to foods, fats, and oils. Many journals listed have been formed from research papers and collected into one volume.

In field of chemical technology, one text reviews properties and practical application of surface active agents; while others discuss basic refractories, industrial hygiene, and toxicology. Section on metallurgy lists topics such as metallic creep, electrical furnaces, powder metallurgy, etc.

Other divisions of catalog itemize books and periodicals related to physics, mathematics, and general science. "Books and Periodicals — 1952" is issued by Interscience Publishers, Inc., Dept. CP, 250 Fifth Ave., New York 1, N. Y. When inquiring specify CP 2752 on handy form, pages 2 and 3.

"I get Positive Pressure without pistons or valves!"

If your material is tough to pump, or if other pumps won't take it, look to the Moyno for proved performance and money-saving low maintenance.

We'll be glad to tell you what Moynos are doing on work that's just like yours, or we'll lab-test whatever you want to handle and guarantee pump output.

Moynos work where other pumps won't—on liquids, heavy slurries, non-pourable pastes. They resist abrasives and chemicals, pass particles and solids in suspension, stand up where other pumps fail.

They self-prime, deliver positive pressures to 1000 p.s.i., meter flow, won't vapor-lock or cavitate. One moving part. Thousands in use. Write for Bulletin C-30-P.

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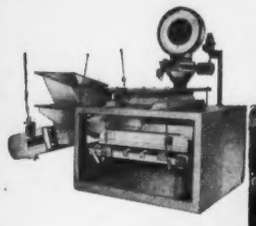
Made in seven frame sizes and several lengths for capacities to 250 g.p.m. Cutaway view shows simple "progressing-cavity" action. Note complete isolation of bearings.

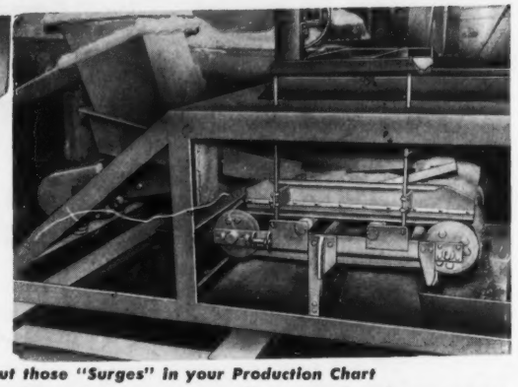
When inquiring check CP 2753 on handy form, pgs. 2-3

SYNTRON

"Weigh-Flow"

GRAVIMETRIC FEEDERS





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Smooth out those "Surges" in your Production Chart

If your product formula requires accurate ingredient control, and your process is a continuous one — Syntron Gravimetric Feeders will provide that control, automatically.

The combination of a scale-mounted, constant-speed belt — with the Feeder's operation regulated by the overweight and underweight movement of the scale — maintains the desired weigh flow of material per unit of time.

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SYNTRON COMPANY
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When inquiring check CP 2754 on handy form, pgs. 2-3

STOP Vapor Losses

with OCECO "Type B"
VENT UNITS

● Combined flame arrestor and conservation vent valve. These units protect both the tank and tank contents from entrance of flame; control and restrict tank breathing and prevent the free escape of vaporized liquids and lowering of gravity ratings. Sturdy, dependable, efficient and trouble-free Oceco construction. 2" to 10" sizes. *Write for Catalog 474-R. It gives full details.*

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THE JOHNSTON & JENNINGS CO.
division of PETTIBONE MULLIKEN CORP.
4751 West Division St. • Chicago 51, Illinois

When inquiring check CP 2755 on handy form, pgs. 2-3

NEW LITERATURE

Outlines typical latex paint formulation

Three-page bulletin lists physical properties of latex compound for use as intermediate in manufacture of paint. Compound contains all necessary ingredients except pigments, fillers, and colors. It consists of the latex, stabilizer, thickener, preservative, antifoamer, and other modifying ingredients.

To illustrate compound's use, bulletin offers a typical formulation for producing high quality white semi-gloss paint. "Synthetic Latex Emulsion Paints" is issued by Plastex Products Company, Dept. CP, 312 Dobbs St., Marietta, Ga. When inquiring specify CP 2756 on handy form, pages 2 & 3.

Overload release cuts power, loosens belt

Four-page bulletin provides information on overload release for manufacturer's torque-arm speed reducers. Units are available for single and double reduction. Capacities range from 1 to 43 hp, and speeds from 12 to 330 rpm. Releases are intended to protect motors, machines, and torque-arm speed reducers.

Pressure exerted by an excessive load causes a piston to move lengthwise through unit. This movement shortens torque arm, loosens the belt, and cuts off current simultaneously. According to bulletin, release is calibrated for adjustment to load conditions of any job. It can be set to act at any desired load up to reducer's maximum capacity.

Dimensions of unit are tabulated and engineering drawings show installation procedure. Bul A-616 is issued by Dodge Manufacturing Corporation, Dept. CP, Mishawaka, Ind. When inquiring specify CP 2757 on handy form, pages 2 and 3.

Protective coatings cut maintenance

Four-page bulletin describes dozen different protective coatings for use in plant maintenance. Coatings are intended to solve such problems as skidproofing, rust prevention, protection against acids and chemicals, waterproofing, etc. Two-color bulletin also describes aluminum and enamel coatings.

Rust-preventing paint penetrates deeply and expels moisture beneath the surface as rapidly as it is applied. According to bulletin, paint is resistant to salt air, fumes, and

Koncentrik DOUBLE-SEAL FITTINGS
give you
2-WAY PROTECTION
...AGAINST COSTLY LINE LOSSES

1 Patented full-floating seat, Teflon reinforced, insures positive leak-proof operation.
2 Heavy duty built for high pressure use.
3 Parts reusable and interchangeable for peak economy.
4 Stainless steel construction resists acids, corrosion.
5 Complete line for tubes to 1" O.D., and for Schedule 5 S and 10 S tubing to ¾". Other sizes to order.

SEND FOR PROOF

Descriptive literature and performance data available upon request. Write today.

THE SPECIAL SCREW PRODUCTS CO.
5445 Dunham Road
BEDFORD, OHIO

When inquiring check CP 2758 on handy form, pgs. 2-3

UP TO 50% Power Savings

The Improved BARCO REVOLVING JOINT

HERE is Barco's new, *improved* Type IBR Revolving Joint for supplying steam, water, oil, or other fluids to rolls, dryers, drums.

LOW TORQUE! Inherent low torque little affected by pressure, speed or temperature—thanks to special ball bearing used in combination with self-lubricating graphite-carbon bearing and new low torque long-life chevron packing.

LEAKPROOF AND LONG LIFE! Note wide spacing between bearings. Insures close alignment and long life for self-adjusting, self-sealing chevron packing.

EASY SERVICING! Internal parts readily accessible—usually without removing joint from roll. Sizes ½" to 2". Single flow or syphon styles. Steam: 150 p.s.i., 450°F., 500 RPM. Hydraulic: 200 p.s.i., 750 RPM.

Send for new Bulletin 300

BARCO MANUFACTURING CO.
1837F Winnemac Avenue • Chicago 40, Illinois

When inquiring check CP 2759 on handy form, pgs. 2-3

EW LITERATURE

mperatures, from -100 to 500°F. nt is said to be fast drying and rviceable for iron or steel whether ey are clean or rusted, new or old.

ransparent properties of masonry terproofer cause surfaces to retain eir natural appearance. Product intended for waterproofing exrior surfaces such as unpainted ment, brick, stone, marble, etc. ater seepage coating is also dcribed for combatting hydrostatic essure. Bulletin states that bondg to concrete block insures dry alls inside.

ul 400 is issued by United Laboraories, Inc., Dept. CP, 16801 Euclid ve., Cleveland 12, Ohio. When quiring specify CP 2760 on handy orm, pages 2 and 3.

Lift truck elevates to 60 or 108"

Two-page bulletin describes 1000-lb apacity lift trucks. Non-telescopic odel has 60" elevated height and elescopic unit elevates to 108". Lift rucks are operated by hand or elecrically driven hydraulic power unit. Bulletin includes line drawings to how dimensions and specifications.

Four-point support is supplied, in hoice of auto steer or swivel casters. A former model featured a fifth wheel teering device. Illustrations suggest ommon applications and also show lift trucks in actual operation. Bul 242 is issued by The Raymond Corporation, Dept. CP, 5790 Madison St., Greene, N. Y. When inquiring specify CP 2761 on handy form, pages 2 and 3.

Engineering data covers worm gearing

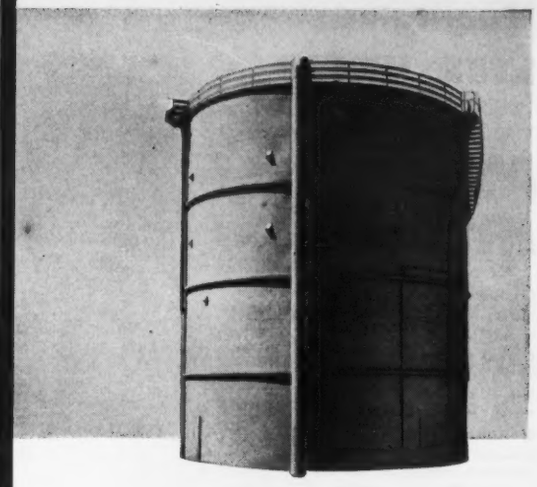
Catalog describes complete line of worm gear speed reducers as well as worm and gear sets for built-in power transmission applications. Each model is illustrated in 180-page catalog. Engineering and application data cover each unit. Information includes dimensions, weights, and rating tables. Catalog may serve as guide in selecting worm gearing and worm gear speed reducers.

Cat No. 400 is issued by The Cleveland Worm & Gear Company, Dept. CP, 3249-59 E. 80th St., Cleveland 4, Ohio. When inquiring specify CP 2762 on handy form, pages 2 and 3.

For more information on product at right, specify CP 2763 . . . see information request blank between pages 2 and 3.

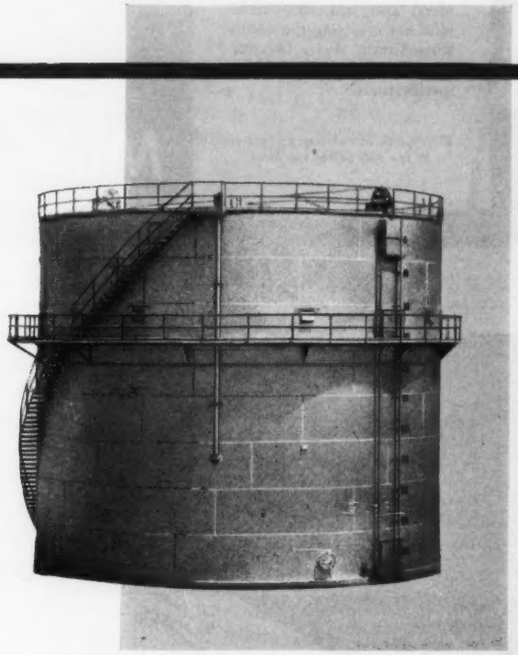
simpler

The Wiggins Gasholder has a remarkably simple design. It has none of the complicated mechanisms of old-type gasholders. No materials that can be harmed by weather.



simplest

Wiggins is the ONLY gasholder that uses no water, no tar, no grease. Wiggins assures no weather worries, no operating costs, no maintenance problems.



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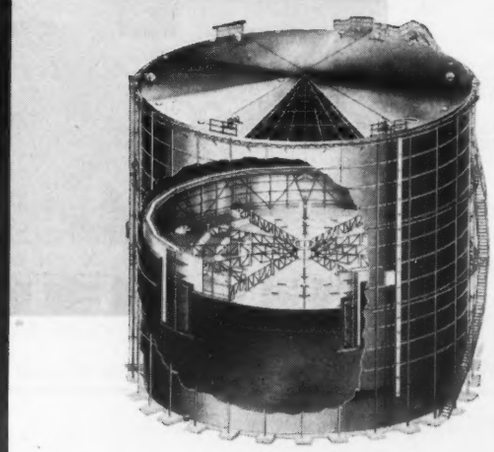
Wiggins is the only gasholder with an absolutely dry, frictionless seal—gas-tight and impermeable.

Wiggins Gasholder

BY GENERAL AMERICAN



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Complete resources permit Multi-Metal's up-to-the-minute fabricating shop to fit to your exact needs any Wire or Filter Cloth Unit, regardless of size, shape, design or metal. Multi-Metal skilfully constructs these units in conjunction with non-metallic materials too, making the simplest or most difficult assemblies.

To serve you better, Multi-Metal also fabricates assemblies not involving the use of Wire Cloth. Write for our catalog and send us your specifications.

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All Meshes
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Multi-Metal
WIRE CLOTH COMPANY, INC.
1350 Garrison Ave., New York 59, N. Y.

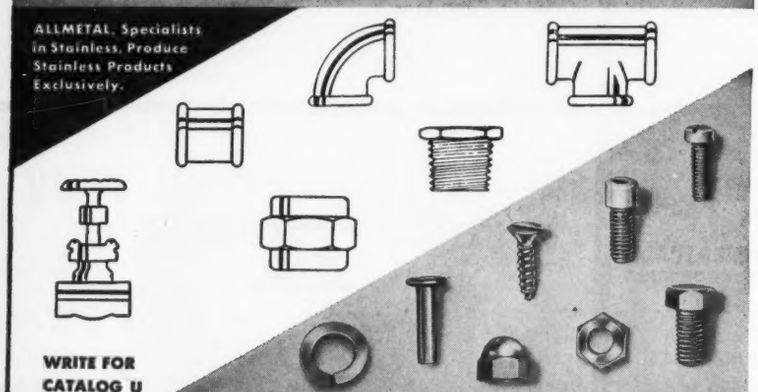
When inquiring check CP 2764 on handy form, pgs. 2-3

FOR YOUR STAINLESS STEEL FITTINGS AND FASTENERS

IT'S ALLMETAL FOR QUALITY AND DELIVERY

Allmetal's fasteners and fittings are stocked in types 304 and 316. Specials to order. All made right by Allmetal.

ALLMETAL, Specialists in Stainless, Produce Stainless Products Exclusively.



WRITE FOR CATALOG U

STAINLESS STEEL FASTENERS

MANUFACTURERS SINCE 1929

ALLMETAL

SCREW PRODUCTS COMPANY, INC.

33 GREENE STREET NEW YORK 13, N. Y.

When inquiring check CP 2765 on handy form, pgs. 2-3

NEW LITERATURE

Research on exhaust hoods views design prospects

Fabrikoid-bound book provides research information on exhaust hood design. Work is based on experimental investigations of air-flow around and into openings of ventilating systems. Discussion covers fundamental theory as well as practical application of theory to actual design of hoods for industrial installations. Originally published as series of research reports, material has been expanded and coordinated with other data on hood, booth, and slot design.

Four chapters of 141-page book are devoted to various aspects of theory. This includes flow of gases, velocity characteristics of canopy hoods, and criteria for determining hood effectiveness. Five chapters cover actual hood design for an assortment of applications. Other topics include grille openings, entrance losses, booth-like structures, woodworking machinery, and examples of hood design calculations. Samples problems and their solutions are worked out in detail.

Thirty tables and 127 illustrations function as supplement to descriptive material. To obtain "Exhaust Hoods" remit $3.50 direct to The Industrial Press, Dept. CP, 148 Lafayette St., New York 13, N. Y. When inquiring specify CP 2766 on handy form, pages 2 and 3.

Pictorial bulletin points-up design of air conditioning pumps

Twelve-page bulletin illustrates several pumps to meet requirements of air conditioning service. On-the-job pictures show pumping units installed to handle evaporative condenser water, circulate chilled water, and operate in cooling towers. Sectional views show eight construction features. Highlight of pump is hydraulic impeller, balanced to reduce thrust and put suction instead of discharge on stuffing box. Units incorporate mechanical seal on shaft, which is oversize to insure minimum shaft deflection and smooth running impeller.

Cartridge-type housing and liquid flinger on shaft serve to protect bearings from dirt and contamination. Pumps range in size from ¼ to 5 hp according to particular application. Larger capacities are available to meet general air conditioning needs. Form 7177 is issued by Ingersoll-Rand, Dept. CP, 11 Broadway, New York 4, N. Y. When inquiring specify CP 2767 on handy form, pages 2 and 3.

Diffuse discharge controls static problems

Five-page paper discusses static problems present in textile industry and in processing synthetic fibers such as acetate yarn, nylon, fiberglas, orlon and others. Report was delivered at 13th annual convention of American Association of Textile Chemists and Colorists. Present control methods are summarized in relation to their efficiency and uses in reducing static. Schematic diagrams aid in telling the story of diffuse discharge control of static. Unit may be applied to processing machines such as dryers, tenters, shears, looms, draw frames, etc.

Static-holding material is bombarded with positive and negative ions, thus neutralizing charge. Control unit is constructed to divert discharge flow when material has been neutralized. Excess discharge flow is grounded and no charge is placed on material. Controlled diffuse discharge may be used in removing static from high-speed textile machinery and processing high-dielectric fibers. Report

Have you changed your address recently?

● If so, you'll want to insure that your copy of CHEMICAL PROCESSING reaches you without interruption. Just send us your new address . . . use the handy form below.

Please answer all questions in regard to your new affiliation, and in addition give us your former address including company, city and state.

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Main Product .....

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City ..... Zone No. ..... State .....

Also analyzes effect of static on quantity and quality of production as well as waste in processing operations.

Report "Static Problems and Their Control in the Textile Industry" is issued by The John Hewson Company, Dept. CP, 106 Water St., New York 5, N. Y. When inquiring specify CP 2768 on handy form, pages 2 and 3.

Automatic temp controls feature electric and pneumatic units

Twelve-page catalog furnishes tables of performance data on 13 temperature control instruments. Units are operated electrically and pneumatically. Controls may be applied in temperature range from –300 to 1800°F. One featured control is intended for regulating temperatures in ovens, furnaces, or other installations where vapor tight cover may be required. Instruments operate through variation in expansion of different solids, but are not to be confused with bi-metallic strip operated thermostats.

Pneumatic temperature control is available with either pilot valve or micro switch to regulate air supply. According to catalog, instrument may be used where any air operated, modulating type, reverse-acting diaphragm valve or motor is to be controlled by temperature. Another featured item is self contained, temperature controlled valve. Unit is intended for temperature control of the flow of air, water, gas, oil, or steam. Valve sizes are ¼", ⅜", ½", and ¾". Schematic illustrations show installation of controls in oven, incubator, and tank.

Cat G-17 is issued by Burling Instrument Company, Dept. CP, 5 Vose Ave., South Orange, N. J. When inquiring specify CP 2769 on handy form, pages 2 and 3.

Handles and tiers unit loads to 4000 and 5000 lb capacity

Two-page bulletin describes electric-propelled, driver-led industrial trucks. Units are capable of stacking, lifting, and moving unit loads up to 4000 and 5000 lb. Sectional illustrations view four models and their dimensions are tabulated. In addition to electric drive, skid platform lift is also powered electrically. Capacity of stackers is proportioned according to load length, which ranges from 30 to 66". Front wheels are rubber, and rear wheels are steel. Right angle turn with 48" platform requires 53½" equal aisle space. Bul No. ST-501 Rev. is issued by Automatic Transportation Company, Dept. CP, 101 W. 87th St., Chicago 20, Ill. When inquiring specify CP 2770 on handy form, pages 2 and 3.

Masks eliminate hazards to breathing and vision

Four-page catalog outlines gas masks, respirators, and eye protective equipment. Respirators are cartridge fed and may be used for open field mixing or spraying of DDT, parathion, aldrin, dieldrin, etc. Gas masks are equipped with canister and belt for service in handling bulk quantities of anhydrous ammonia. Masks also provide protection against ammonia refrigerants or hydrocyanic acid gas used in grain fumigant operations.

Three models are illustrated to meet specific requirements for eye protection. Face shield is 8½ x 6" and goggles are available with green or clear lens. Bul "Agricultural Protective Equipment" is issued by Willson Products, Inc., Dept. CP, 567 Thorn St., Reading, Pa. When inquiring specify CP 2771 on handy form, pages 2 and 3.

How B&W ALLMUL cuts severe service refractory costs

LEAD DROSS FURNACE

"ALLMUL proves more economical than any refractory tried!"

A plant with several reverberatory type smelting furnaces, used to melt alloys of lead, tin and antimony, carried on an extensive investigation to obtain economical refractory linings. Practically every type of refractory was tried. Side-by-side tests in the same furnace proved the economy of B&W Allmul over all others. Result? Allmul is now standard for these furnaces.

CONTINUOUS WELD PIPE FURNACE

"Three times the life in worst wear areas!"

A large manufacturer was troubled by the short life of kyanite-base refractories in certain areas of his furnace. Then B&W Allmul were installed in the uptake arches, a critical, severe-service area. Result? Allmul lasted three times as long as previously used refractories and has been ordered for general use in all areas of this manufacturer's furnaces of this type.

INDIRECT ARC FURNACE

"All furnaces converted to ALLMUL after comparative tests"

A large company making alloy steel castings has several indirect arc furnaces melting various alloys, with pouring temperatures varying from 2700F to 3100F. With highest temperature alloys, semi-mullite brick burned out in 6 to 10 heats. B&W Allmul, which cost approximately the same, showed no appreciable wear after 20 heats. On alloy steels in general, this customer reports far-less slag formation (an indication of reduced refractory wear) with Allmul than with any other refractory used. Result: All furnaces are being relined with B&W Allmul Firebrick.

ELECTRIC FURNACE ROOF

"ALLMUL lasts 3 to 6 times as long"

In a six-ton electric furnace, handling 15 tons of stainless steel per charge, super duty firebrick had to be replaced every 20 to 40 heats. Pouring temperature of the metal was in excess of 3100F, with higher temperatures attained in the furnace during periods of oxygen introduction. The owner installed B&W Allmul Firebrick, hoping for a life of 80 heats. Allmul in the first roof lasted for 122 heats—42 more than hoped for. The second roof of Allmul went to 131 heats! Result? Further orders for Allmul.

Yes, the facts about B&W Allmul Firebrick speak for themselves. This fused-mullite brick is proving its economy in dozens of severe service applications. The reason? A unique combination of refractory properties—high hot load strength, high resistance to spalling, good volume stability, a high melting point of 3335F—all resulting in lower furnace costs. Want more data? Write for Bulletin R-29.

BABCOCK & WILCOX

THE BABCOCK & WILCOX CO.
REFRACTORIES DIVISION
GENERAL OFFICES: 85 LIBERTY ST. NEW YORK 6, N.Y.
WORKS: AUGUSTA, GA.

R-449

B&W REFRACTORIES PRODUCTS — B&W Allmul Firebrick • B&W 80 Firebrick • B&W Junior Firebrick • B&W Insulating Firebrick B&W Refractory Castables, Plastics and Mortars • OTHER B&W PRODUCTS—Stationary & Marine Boilers and Component Equipment . . . Chemical Recovery Units . . . Seamless & Welded Tubes . . . Pulverizers . . . Fuel Burning Equipment . . . Pressure Vessels . . . Alloy Castings

When inquiring check CP 2772 on handy form, pgs. 2-3

NEW LITERATURE

Reinforced plastics vie for new fields

Four-page bulletin surveys horizon for polyester resins reinforced with fiberglass. High strength laminates of reinforced plastics are light in weight and can be adapted to wide range of products. Great dimensional stability of laminates permits the production of parts with uniformly close tolerances.

Fiber-glass reinforced laminates have high impact resistance. Color can be molded into hard surfaces which resist common solvents, rusting and rotting. Polyester resins laminate well with glass fibers, rayon, paper, asbestos, or similar materials at pressures varying from simple contact to high pressure.

Two-color bulletin pictures commercial products made of reinforced plastic. Polyester resin laminates cure at temperatures from 100 to 300°F and may be bonded to porous materials such as wood or foamed resins. Glass fibers contribute tensile strength to the extent of 250,000 psi.

"Materials for Reinforced Plastics" is issued by Plaskon Division, Libbey-Owens-Ford Glass Company, Dept. CP, Toledo 6, Ohio. When inquiring specify CP 2773 on handy form, pages 2 and 3.

Catalogs complete line of electric fork trucks

Twenty-page catalog surveys capabilities and applications of electric fork trucks. Seven models are individually described according to operating characteristics and engineering developments. Maintenance features, accessories, and attachments are also explained and illustrated.

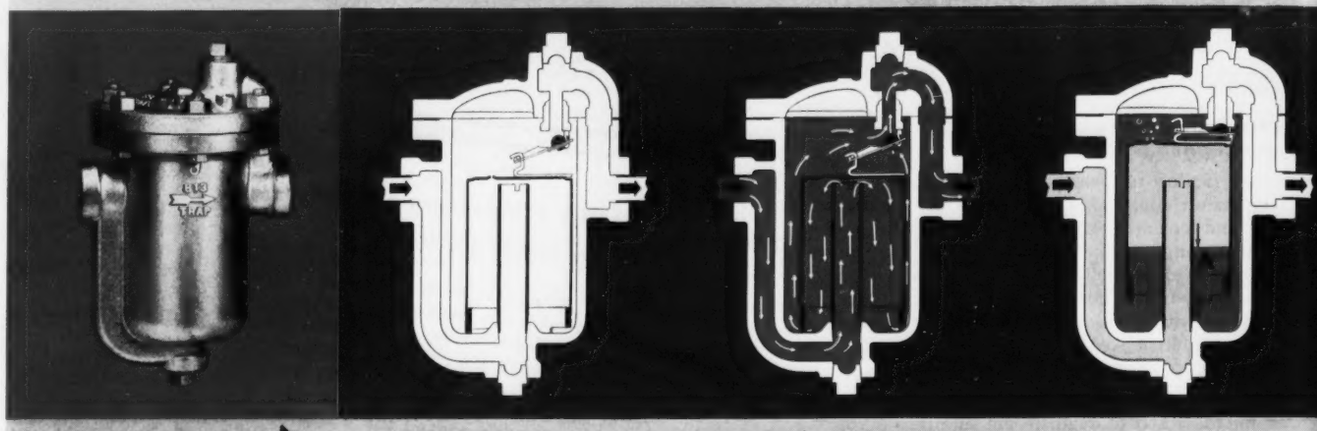
"Electric Fork Trucks" is issued by Lewis-Shepard Products Inc., Dept. CP, Watertown, Mass. When inquiring specify CP 2774 on handy form, pages 2 and 3.

1000 gph is capacity of centrifugal pump

Two-page specification folder lists operating features of centrifugal pump. Unit is completely submersible and hermetically sealed. Pump will handle variety of liquids and is suited for coolant applications in industrial plants. Maximum pump capacity is 1000 gph at zero head, with a maximum head of 9 ft. Height of pump is 7¼" and overall width is 5 13/16".

Submersible feature enables pump to be placed directly into liquid and thus eliminates pump-belt-motor con-

ARMSTRONG TRAPS are



A WORKING PICTURE OF ARMSTRONG DESIGN

1. When trap is first installed, the inverted bucket is down and the valve is wide open.

2. When steam is turned on, condensate (solid color) flows into trap and out through discharge orifice, until . . .

3. steam (light color) reaching the trap floats the inverted bucket and closes the valve.

THE highly efficient design of modern Armstrong traps directly reflects over 40 years' experience in inverted bucket trap manufacture and application gained since Armstrong developed the first practical inverted bucket trap in 1911.

Armstrong design offers:

- A "frictionless" leverage system which combines high leverage with wide opening of a large orifice.
- A minimum of parts.
- Strong, corrosion-resistant and wear-resistant materials.
- Generous margins of safety.

For trap users this means:

- Large capacity.
- Dependable service under adverse operating conditions.
- Low maintenance.
- Continuous operation of heating and process equipment.

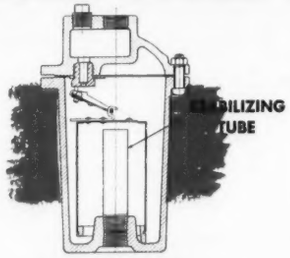
The soundness and benefits of Armstrong design have been proved in thousands and thousands of plants all over the world. To insure dependable condensate drainage for a new plant or plant expansion, simply specify: "Traps shall be Armstrong." For additional information, call your local Armstrong Representative or write:

ARMSTRONG MACHINE WORKS
880 Maple St., Three Rivers, Michigan

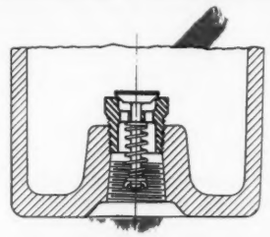
SELF-SCRUBBING ACTION (see Fig. 2 above). Note that condensate first flows down *between bottom of bucket and trap body*, then up and out through orifice. The high velocity flow under bottom of bucket keeps dirt in suspension, washes it out when trap opens. No dirt problems with Armstrong design.

BUCKET FLOATS WHEN LESS THAN ⅗ FULL OF STEAM (see Fig. 3 above). The generous margin of safety (dimension A in Fig. 3 above) insures that the bucket will float with trap body partly full of water. A heavier bucket would give more power but it might not float and close the valve.

SOME OTHER ARMSTRONG



STABILIZING TUBE
Condensate, air and steam are admitted above water level in trap bucket. The water level is undisturbed, eliminating wear-producing agitation of the bucket, valve lever and valve. This exclusive feature greatly lengthens life of working parts.

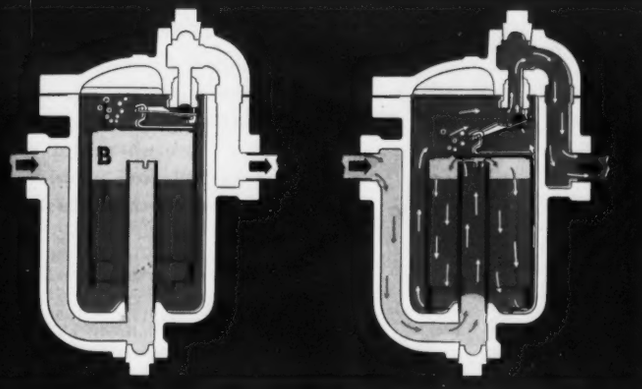


INTERNAL CHECK VALVE
All Armstrong traps can be equipped with the Armstrong spring-loaded stainless steel check valve. Costing less than an external check valve, it also saves installation labor and fittings.

ARMSTRONG · INVERTED BUCKET STEAM TRAP

ARMSTRONG

Designed to give better Performance!



4. When more condensate enters the trap, the bucket loses buoyancy and pulls on valve lever.

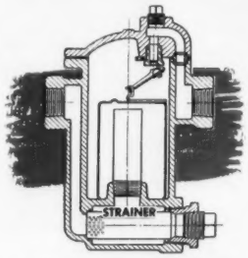
5. When weight of bucket times leverage overcomes pressure on valve, bucket sinks and opens trap.

NO AIR BINDING (see Fig. 4 above). Air mixed with steam passes through the bucket vent, collects at top of trap and is discharged ahead of condensate. The large air-handling capacity of Armstrong traps insures top equipment temperatures and faster heat-up.

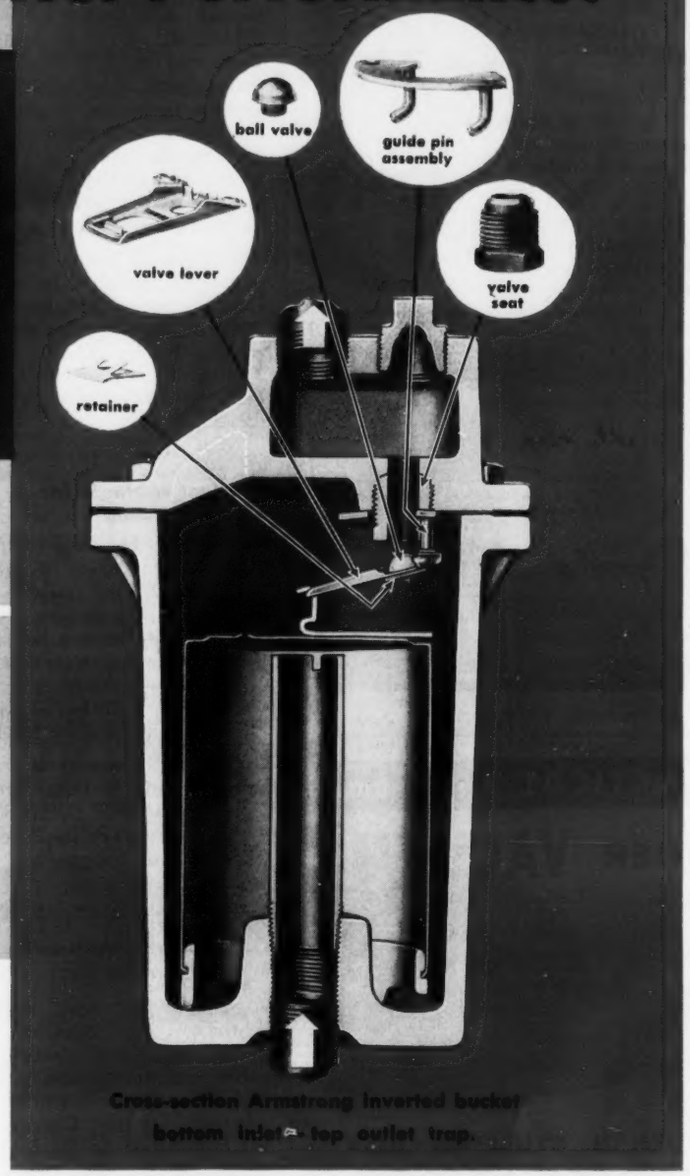
EXCESS POWER PROVIDED FOR OPENING TRAP (see Fig. 5 above). Weight of bucket times leverage opens trap. Here again Armstrong design provides a generous safety margin. Reducing dimension B in Fig. 4 would increase power of bucket but margin between test opening pressure and operating pressure would be too low to allow for normal wear and for pressure fluctuations.

TRAP DESIGN FEATURES

THERMIC VENT BUCKET
Where large amounts of air must be discharged when steam is turned on, and where air can be pushed out ahead of incoming steam, this bucket will speed heat-up greatly. The vent is open when trap is cold, closes at 210° F. Has 50 to 100 times air handling capacity of standard buckets.



INTEGRAL STRAINER TRAPS
The two smallest sizes of Armstrong traps, most apt to need strainer protection, are available in a body style having the strainer built right in. The strainer can be cleaned while trap is operating.



Cross-section Armstrong inverted bucket bottom inlet—top outlet trap.

SEND FOR *NEW*
44-PAGE STEAM TRAP BOOK

Complete data on Armstrong trap design and operation; physical data and list prices; capacities; selection, installation and maintenance recommendations. Free on request.

STEAM TRAPS

NEW LITERATURE

nections. Three types of starting arrangements are non-automatic, automatic, and manual-automatic. Folder presents sectional illustration of pump and various dimensions.

Shaded pole motor operates in oil bath at 1550 rpm. All critical parts exposed to fluid are made of corrosion-resistant materials. Bearings are of sleeve type and not exposed to water. Wattage input ranges from 170 to 140 w for pumps with heads of 3, 5, 7, and 9'. Units find application in circulation of water bath, evaporative coolers, disposal of waste water, etc.

Folder P-104 is issued by Kenco, Incorporated, Dept. CP, 1125 N. Ridge Rd., Lorain, Ohio. When inquiring specify CP 2775 on handy form, pages 2 and 3.

Mold release applications in rubber, plastics processing

Silicone mold release agents and their advantages in major applications in rubber and plastics molding is the story told in new 8-page, 2-color bulletin. Story is told by means of a series of captioned photos and descriptive text.

Form MR3A is issued by the Dow Corning Corporation, Midland, Mich. . . . or for more information check CP 2776 on handy form, pages 2 & 3.

Describes tachometers 1/4% accurate

Three types of tachometer indicators having 1/4% accuracy are described in 2-page illustrated data sheet. Instruments have 10 overlapping or adjoining ranges instantly selectable by a rotary switch.

Other features listed in the data sheet are: 1) wide speed ranges (36 to 100,000 rpm), 2) dirt-proof, 3) only one moving part — the pointer, 4) requires no lubrication or other periodic servicing, 5) easily mounted on panel or bracket. Inherent stability, ruggedness, and simple calibration insure sustained accuracy under adverse conditions, manufacturer reports.

Data sheet No. 42HJK is issued by the Metron Instrument Co., Dept. CP, 432 Lincoln St., Denver 9, Colo. When inquiring specify CP 2777 on handy form pages 2 and 3.

For more information on product at left, specify CP 2778 . . . see information request blank between pages 2 and 3.

M&L "Standardized Flexibility" Saves You DOLLARS and DRUDGERY!

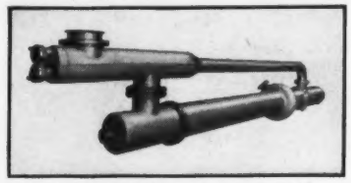
Thousands of HEAT EXCHANGE Equipment installations have proven the wisdom of M & L "Standardized Flexibility"—providing custom-built equipment from standard basic elements—saving dollars in cost and drudgery for design engineers.

To make this method economical to users a great deal of experience and know-how is required. We have this in quantity, and many internationally known concerns in the chemical processing and allied fields, are reaping the benefits.

RETUBING and REPAIR SERVICE

Single pass or multi-pass: straight, U-tube, or bent tube; baffled or non-baffled; fixed tube sheets or floating head—for any type of service. Our plant is equipped to handle this work quickly and economically.

Send for Bulletin 790



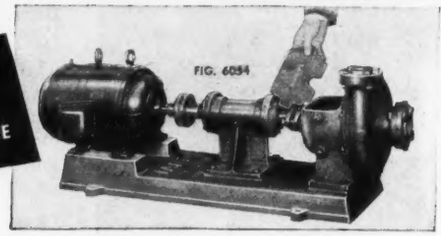
M & L REBOILER — An example of special M & L heat exchange equipment.

Manning & Lewis Engineering Co.
30 Ogden Street Newark 4, New Jersey
SALES REPRESENTATIVES IN PRINCIPAL CITIES
M&L 1897

When inquiring check CP 2779 on handy form, pgs. 2-3

TABER for Higher PRACTICAL Performance

PUMPING UNDER VACUUM



BULLETIN CL-339 AVAILABLE

NO LEAKAGE THRU STUFFING BOX IN HANDLING CHEMICAL SOLUTIONS.

When in vacuum service on evaporators, the Taber drip chamber prevents air from entering thru the packing. The illustration above indicates how this is accomplished. • Water-sealing of the stuffing box is absolutely dependable.

Many of the foremost companies in the chemical and processing industries rely on adaptable, efficient Taber Single Suction Centrifugal Pumps. Built in any metal or alloy obtainable as specified by customer. • Please use business stationery when writing for Bulletin CL-339.

TABER PUMP CO. *(Est. 1859)* 320 Elm St., Buffalo 3, N. Y.

TABER PUMPS

When inquiring check CP 2780 on handy form, pgs. 2-3

NEW LITERATURE

Publication gives more on nuclear data

Second supplement to government publication on nuclear properties is announced by NBS. Work is intended for engineers, radiochemists, and other workers in nuclear physics. Supplement contains 63 pages and 98 tables. Information includes experimental values of half-lives, radiation energies, relative isotopic abundances, nuclear moments, and cross sections.

Year's list of fission and spallation papers is included in supplement. Decay schemes and level diagrams are provided wherever possible. To obtain "Nuclear Data," Supplement 2, remit $4.25 direct to Government Printing Office, Dept. CP, Washington 25, D.C.

Airblast cabinets for minor cleaning

Various sizes and range of applications are shown in catalog of airblast cabinets. Units are available in both suction and pressure type models. Suction type cabinets can be used where limited space requires a bench mounting. Unit-type machines are intended for cleaning small lots of work which can be manipulated by hand.

Cat 31-A is issued by American Wheelabrator & Equipment Corp., Dept. CP, 1036 S. Byrkit St., Mishawaka, Ind. When inquiring specify CP 2781 on handy form, pages 2 and 3.

Outlines information on synthetic material

A number of highly resistant and flexible synthetic materials, including fluorocarbons, for gaskets, packing, valve seats, tubing, mechanical parts, and "O" rings are described in 4-page illustrated bulletin. Concise and helpful information on the physical, electrical, and chemical properties of Fluoroflex products made from Teflon resin, and polymers of trifluorochloroethylene.

Bulletin is issued by the Resistoflex Corp., Dept. CP, Belleville 9, N. J. When inquiring specify CP 2782 on handy form, pages 2 and 3.

Outlines requirements for patent and copyright

Fiber-bound book outlines preliminary steps in obtaining patents or copyrights. Topical index permits quick location of information applying to drawings, designs, or works of scientific or technical character. Book dis-

Investigate the Advantages of H & K PERFORATIONS

— for cleaning, grading, straining and filtering . . . guarding and ventilating . . . acoustical treatment . . . ornamental enclosure, and related problems of product and machine design.

You have a wide selection of patterns to choose from, all accurately perforated. For commercial processing, perforations may be had with as close as ± .0005". Materials include practically all metals and sheet materials such as plastics, fabrikoids, plywood, etc. Ornamental grilles may still be furnished in steel with painted finishes.

Perforated sheets may be furnished rolled, formed, sheared, welded, brazed or otherwise fabricated to your specifications.

Catalog No. 62 tells the "hole" story —write for it!

The Harrington & King PERFORATING Co.
5636 Fillmore Street, Chicago 44, Illinois
114 Liberty Street, New York 6, New York

When inquiring check CP 2783 on handy form, pgs. 2-3

WELD METAL of highest quality

CHEMICALLY RIGHT
PHYSICALLY RIGHT
METALLURGICALLY RIGHT

Use ARCOS Stainless Electrodes

When you put Arcos Chromend or Stainlend Stainless Electrodes to work on a critical welding job, you want to be sure of consistent, dependable results. That's why every Arcos Stainless Electrode is tested and retested throughout its manufacture.

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WELD WITH ARCOS
Stainless, Low Hydrogen and Non-Ferrous Electrodes

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sses what is eligible for patent and es case histories which show court terpretation.

ne section is devoted to mechanical ements which "may be used as parts f a patentable device if a new, useful nd unexpected result is produced." pproximately 110 of these mechani- l devices or movements are illustrated the 125-page book. Author con- ludes with brief discussion of patent pplication, patent infringement, and bibliography.

"Copyright, Design and Patent Guide" is distributed by Ameliorant Co., Inc., Dept. CP, P.O. Box 108, Halesite, L. I., N. Y. When inquiring specify CP 2785 on handy form, pages 2 & 3.

Reports on bone char research and testing

Proceedings of Second Technical Session on Bone Char are reported in 436-page book. Session covered general topics such as test procedures, defecation preliminary to char filtration, filtration procedures, and bone char kilns. According to report, test procedures section is expected to form the nucleus of standard methods for testing bone char.

Session was sponsored jointly by NBS and industrial concerns supporting bone char research. Information was presented on current status of research program of Bone Char Research Project, Inc. To obtain "Proceedings of the Second Technical Session on Bone Char, 1951", remit $4.00 direct to Bone Char Research Project, Inc., c/o Revere Sugar Refinery, Dept. CP, 333 Medford St., Charlestown 29, Mass.

Tech literature index covers aluminum

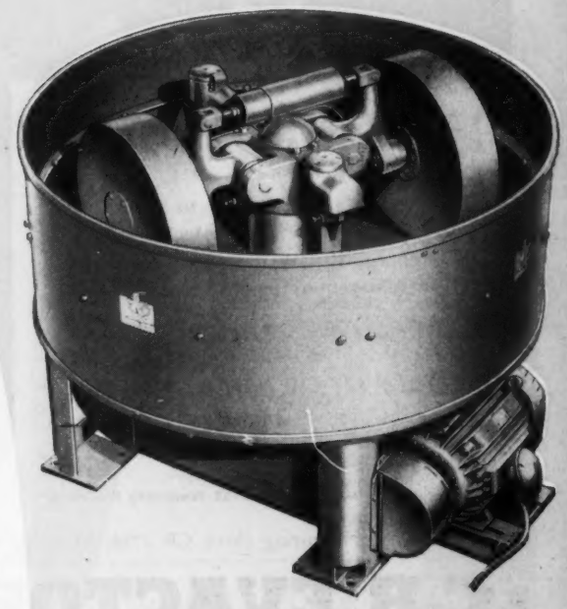
Six-page folder lists technical literature and movies dealing with metal-working industry. Material covers various phases of aluminum according to application, products, design, fabrication, and general information. Index includes approximately 80 different manuals about aluminum, and lists seven motion picture films relative to metal-working industry. Movies are available on 16 mm, sound, color film. "Literature and Movie Index" is issued by Reynolds Metals Company, Dept. CP, 2500 S. Third St., Louisville, Ky. When inquiring specify CP 2786 on handy form, pages 2 and 3.

For more information on product at right, specify CP 2787 . . . see information request blank between pages 2 and 3.

Presenting the **NEW HIGHER CAPACITY 2F and 3F**

SIMPSON *MIX-MULLERS*

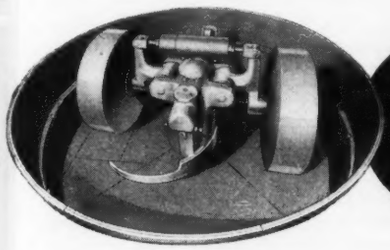
For Faster—
Better—
Lower Cost Mixing



SIMPSON Mix-Mullers do a *superior* job of material preparation because these modern machines employ the true mulling principle of controlled mixing.

That's why the two new higher capacity SIMPSON Mix-Mullers, the Model 2F and 3F, are so important in solving mixing problems where *intimate* mixing is vital to the ultimate production of quality products. This increasing need for *intimate* mixing has definitely indicated a trend toward adjustable and increased mulling pressures . . . here featured on the new 2F and 3F Mix-Mullers. The results are even faster, better, lower cost mixing than ever before.

The 2F and 3F SIMPSON Mix-Mullers use comparatively light mullers, and employ a unique spring-loaded muller arrangement which allows complete adjustment for all types of material. Because of the advanced design of the 2F and 3F Mix-Mullers, the material to be mixed is subjected to much more *Intensive Mulling* action. Each particle of material is coated with other components of the mix—not merely placed next to each other as is often the case in conventional type mixers. This intimate intensive mulling action prevents segregation after mixing . . . in handling . . . and in transit.



DO YOU REALLY KNOW WHAT MULLING IS?

WATCH the practiced technique of a chemist's mortar and pestle—the intensive smearing and rubbing actions—and basically THAT'S MULLING. Nothing compares with it in uniformly blending dry, semi-dry or pasty materials.

It is this process which develops the full potential qualities of the material through the "working and kneading" action. Obviously the best muller pressure-area ratio is that which will act upon the greatest number of grains per revolution of the muller. In the 2F and 3F Simpson Mix-Muller the ideal action is obtained by adjusting the muller pressure for the material being mixed. High unit pressure acting throughout a deep bed of material, the most effective condition, is obtained with the new muller design and the heavy compression spring.

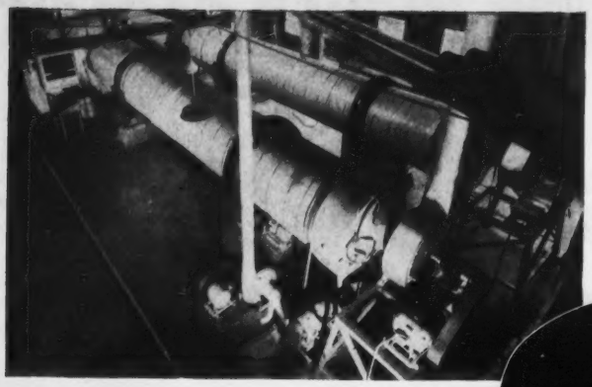
ADVANTAGES

Here are the basic reasons why the new 2F and 3F Simpson Mix-Mullers are the "last word" in modern, scientific mixing.

1. Most thorough mulling action ever developed.
2. Greatest flexibility of operation ever offered.
3. Greater mulling speed—faster discharge.
4. Large batch capacity.
5. Greater uniformity—better batch control.
6. Much simpler, safer operation & maintenance.
7. Less horsepower required.
8. Incorporates all features of rugged construction and intensive mulling principle that have made Simpson Mix-Mullers the standard of the industry for over 30 years.
9. V-belt drive assures maximum flexibility and greater safety factor against sudden overloads.
10. Design backed by years of actual service.

WRITE FOR BULLETIN 509
—Just off the press

SIMPSON *MIX-MULLER* DIVISION
NATIONAL ENGINEERING CO., 624 Machinery Hall Bldg., Chicago 6, Ill.



DIRECT FIRED DRYER

Two Direct Fired Dryers.

If your product is not critical to high temperatures, you can dry it more economically in a Davenport Rotary flash or direct fired dryer. Let Davenport engineers assist you.

Write for our complete catalog.

DAVENPORT MACHINE and FOUNDRY COMPANY

DAVENPORT 4, IOWA

For quick reference see "Sweet's 1952 Processing Industries" file.

DAVENPORT

De-watering Presses and Screens.

ROTARY

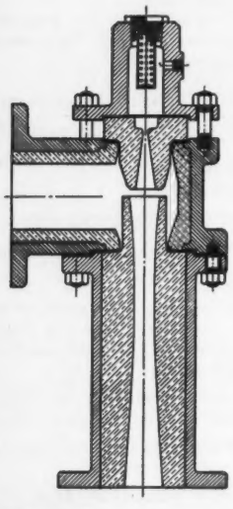
Steam Tube, Hot Air and Direct Fire Dryers.

Water Tube and Air Coolers.

When inquiring check CP 2788 on handy form, pgs. 2-3

C-R EVACTORS

MEET CORROSION PROBLEMS



The chemical industries are employing more and more Croll-Reynolds Evactors in vacuum processes where corrosion resistance is a major consideration. These steam jet vacuum units provide pressures ranging from a few inches to a few microns. Croll-Reynolds is a pioneer in the use of new construction materials and our engineers are investigating corrosion problems continually.

Stainless steels, Monel metal, Beryllium copper, Ni-Resist, PMG metal, hard lead, special bronzes, Hastalloy, and Illium are but a few of the special metals which find their way into our equipment. Carbon is used extensively as a lining material, and many plastics including Teflon and synthetic materials are used for making complete Evactors.

Consult our engineers for high vacuum equipment carefully designed for your specific conditions, and constructed of materials selected for your particular conditions.

Please address Department B

CROLL-REYNOLDS CO., Inc.

Main Office:
751 Central Ave., Westfield, N. J.
New York Office:
17 John Street, New York 38, N. Y.

CHILL VACTORS • STEAM JET EVACTORS • CONDENSING EQUIPMENT

When inquiring check CP 2789 on handy form, pgs. 2-3

NEW LITERATURE

Price list indexes raw materials

Twelve-page price list outlines an assortment of essential oils, aromatic chemicals, and allied products. Among 14 types of raw material listed are animal and resinoid fixatives, oleoresins, tinctures, citrus concentrates, floral concentrates, etc. Materials are available in wholesale quantities only, and the various items are arranged alphabetically.

Parenthetical inserts specify approximate strength of chemicals and oils. Several coloring substances are listed in one and five lb quantities. "Price List" is issued by Fritzsche Brothers, Inc., Dept. CP, 76 Ninth Ave., New York 11, N. Y. When inquiring specify CP 2790 on handy form, pages 2 and 3.

Forty page review of valves — 1/8 to 1"

Engineering data and illustrations are offered in 40-page catalog of needle, globe, ball check, relief, and plug type valves. Sizes range from 1/8 to 1" in valves which are made of brass, aluminum alloy, steel, or stainless steel.

Two-color catalog reviews complete line of valves, formerly manufactured by Parker Appliance Co., for either pipe or tube connection.

Catalog is issued by Republic Manufacturing Company, Dept. CP, 1930 W. 77th St., Cleveland 2, Ohio. When inquiring specify CP 2791 on handy form, pages 2 and 3.

Cools lab samples to room temp

Four-page bulletin illustrates three models of metal desiccator for cooling heated lab samples to room temperature without moisture pickup. One unit is designed for crucible cooling by direct conduction through desiccator walls. Second type is equipped with fan which blows cooling air against base plate.

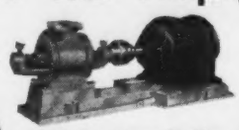
Third model has fan inside and outside of cooling chamber. It is intended for cooling samples of wool, baked sand cores, leather, and similar material where heat conductivity is slow and uncertain. Path of heat transfer is indicated in cutaway illustrations. Cylindrical desiccators have over-all height of 7, 12, and 22" respectively.

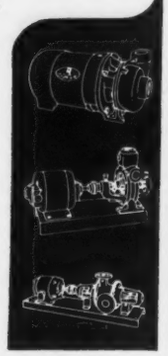
"Dietert-Detroit Speed Desiccators" is issued by Harry W. Dietert Company, Dept. CP, 9330 Roselawn Ave., Detroit 4, Mich. When inquiring specify CP 2792 on handy form, pages 2 & 3.

Better on "1001" Pumping Duties

Capacities to 150 G.P.M.

Heads to 500 Ft.





APCO Two-Stage Turbine Type Pump for High Pressure Service

Apco—the pump with but one moving part, the impeller — is famous for long-lived, efficient performance on small capacity, high head duties. Available in Single Stage, Two Stage and 4-Stage Tandem for high pressures — and Water Jacketed for high temperature and highly volatile liquids.

Write for Bulletins 111, 111-A, 111-WJ

DISTRIBUTORS IN PRINCIPAL CITIES

Aurora Always Pumps

AURORA PUMP COMPANY

62 Loucks Street, Aurora, Illinois

When inquiring check CP 2793 on handy form, pgs. 2-3

Smooth Vibrationless PROPELLERS

for MIXING, STIRRING AERATING, PUMPING AGITATION

A Michigan 34" Stainless Steel propeller with split hub for mounting in receptacle through manhole.

Manufactured by an exclusive process, Michigan propellers are perfectly balanced to avoid whip and strain on shafts. They are available for original equipment, replacement or special application in a wide range of materials and in sizes up to 60". Write for latest data folder.

MICHIGAN WHEEL CO.

GRAND RAPIDS 3, MICHIGAN

When inquiring check CP 2794 on handy form, pgs. 2-3

NEW LITERATURE

Tables list 56 dipping baskets for solution processing

Illustrations and tabular materials serve to describe dipping baskets for use in immersing objects in electrocleaning and electroplating solutions. Bulletin covers 12 standard-style wire baskets and includes three tables with dimensions of 27 round, 7 tray, and 22 rectangular models. Information is given on general size and shape, as well as data on available wire sizes and different meshes. Chart indicates when to use metallic or rubber covered baskets for acid dips, alkali cleaners, bright dips, cyanide dips, and etching.

Concluding section of bulletin is devoted to special baskets of sheet metal, rubber covered, and scrap-anode types.

Perforation sizes and dimensions are also included for these baskets. Bul D-108 is issued by Hanson-Van Winkle-Munning Co., Dept. CP, Matawan, N. J. When inquiring specify CP 2795 on handy form, pages 2 and 3.

Charts size, materials, capacities for conveyors and elevators

Layout drawings, calculation tables, charts, formulas, photographs — all contribute to thorough coverage of conveyors and elevators for handling bulk materials. Fully enclosed units serve as self-feeding conveyor or conveyor elevator. According to 28-page booklet, the assembly consists of an endless chain with spaced, solid flights in a close-fitting enclosure. Materials are moved in continuous mass along horizontal, vertical, or inclined paths. Unit is dust tight to prevent contamination.

Solid conveyor flights permit operation either fully or partially loaded. These flights move material in compartments to prevent avalanching on vertical or steeply inclined runs. Design flexibility of units may be utilized in forming L-paths and vertical run-arounds. Properties of 150 bulk materials are analyzed for such characteristics as average weight, size, flowability, and abrasiveness. Conveyors are said to find application in handling carbon, boric acid, graphite, resin, sulfur, etc.

Book No. 2475 is issued by Link-Belt Company, Dept. CP, 307 N. Michigan Ave., Chicago 1, Ill. When inquiring specify CP 2796 on handy form, pages 2 and 3.

Safety rules apply to all phases of construction, maintenance

General standards of safety in construction and maintenance work are outlined in 56-page booklet. Rules are given for safety measures in overhead work, excavations, electrical maintenance, machine repair, plumbing and steamfitting, and outside construction. General standards to safety apply to use of equipment and to methods of storing and protecting equipment from fire and other hazards. Suggestions are made for use of "hold-off tags" when repairing, adjusting, or oiling power driven machines.

Assortment of illustrations serve to emphasize the various safety operations. Section on electrical maintenance discusses precautions to be observed when installing electrical wiring and equipment. Booklet specifies authorized personnel who may do various maintenance tasks. Several inspection report forms are presented as well as a table of safe working loads for tackle blocks.

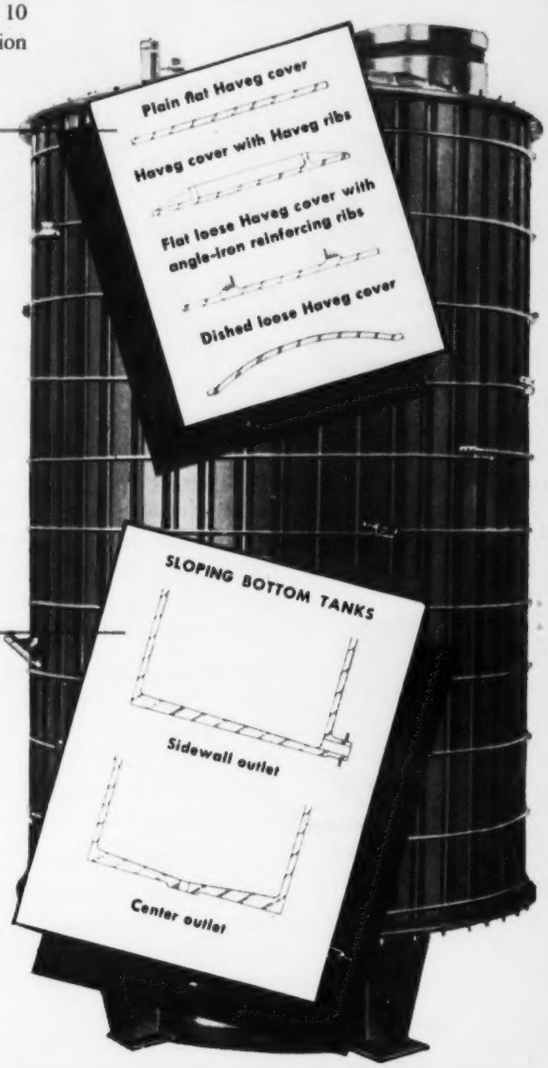
"Maintenance and Construction Manual" is issued by Allis-Chalmers Manufacturing Company, Dept. CP, 1126 W. 70th St., Milwaukee 1, Wis. When inquiring specify CP 2797 on handy form, pages 2 and 3.

IMPORTANT ANNOUNCEMENT! FACTORY CAPACITY HAS BEEN DOUBLED! DELIVERIES ARE GETTING MUCH BETTER!

HAVEG is not a tank lining or coating. It is a solid, molded non-metallic material that the HAVEG CORPORATION fabricates to your specifications in its Marshallton, Delaware plant. Large size equipment can be molded in single pieces without seams or joints at low cost. Tanks can be made in one seamless piece as large as 10 feet in diameter by 12 feet in depth. HAVEG resists the corrosion effects of practically all acids, bases, and salts.

TANKS

HAVEG


Plain flat Haveg cover
Haveg cover with Haveg ribs
Flat loose Haveg cover with angle-iron reinforcing ribs
Dished loose Haveg cover
SLOPING BOTTOM TANKS
Sidewall outlet
Center outlet

From TOPS

Where tanks are vented to the atmosphere, four types of covers may be obtained. HAVEG can be machined and repaired readily so that pipe connections, manholes, changes to the system present no problem to the installation and maintenance crew.

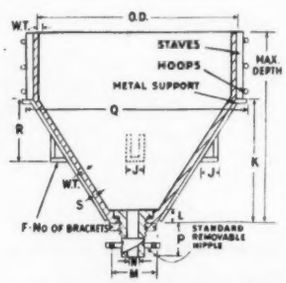
HAVEG CYLINDRICAL TANKS

CUT COSTS . . . RESIST CORROSION

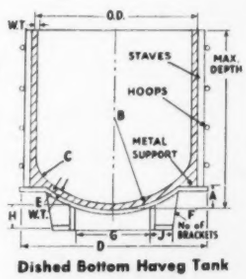
Here are tanks with amazing long life, through and through resistance to corrosion! HAVEG cylindrical tanks have been successfully used for storage, pressure, pickling, and separating tanks, dye vats, crystallizers, surge tanks and stills. Consult your nearest HAVEG engineer now for technical advice, delivery, and price information. Specify HAVEG corrosion resistant equipment . . . tanks, towers, pipes, valves.

To BOTTOMS

Get the best bottom for the process with molded HAVEG. Sloping bottom tanks can be provided with outlets at any location. For more complete drainage, dished bottom tanks are available and when suspended solids are present, cone bottom tanks can be provided.



Cone Bottom Tank for applications requiring complete drainage.



Dished Bottom Haveg Tank

Write Today for a complete 64-page, illustrated, technical bulletin on HAVEG corrosion resistant equipment. This Bulletin F-6 has chemical resistance tables for various HAVEG grades, tank sizes, installation and machining information. If you have a corrosion problem, HAVEG can help you. ***Write Now!***

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When inquiring check CP 2798 on handy form, pgs. 2-3

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NO. 620EG CHEMISEAL PACKING

Hundreds of reports say Chemiseal Packings are doing a good job on installations where other packing materials failed completely.

Good reason—they are made of Teflon* which resists all chemical attack excepting only molten sodium and fluorine. Chemiseal packing cannot contaminate the process. They require light gland pressure, permitting free shaft and spindle action, and are good from —110°F. to 500°F.

For rotating or reciprocating shafts, select Chemiseal Type 711—the packing that imposes least torque on the shaft and not only prevents axial seepage, but seals against stuffing box and shaft as well.

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When inquiring check CP 2799 on handy form, pgs. 2-3

NEW LITERATURE

Bibliography of progress in electronics

Technical advances in electronic industry are compiled in bibliography. Reports cover developments in electron tubes, electronic computing machines, radar, and electronic equipment for scientific research. One work describes designing of a pentode reactance modulator capable of producing frequency shift of plus or minus 50 kc with distortion of less than 1%. Another publication describes a high-speed product integrator, which obtains a one-hundred-point solution every 1.67 sec. Instrument is made up of electronic differential analyzer components and set of motor-driven potentiometers.

In field of power supply, an experimental study covers "Static Frequency Transformers For Small Electric Motors." This 28-page work discusses possibilities of operating single-phase asynchronous motors by means of static frequency transformers. Investigation deals with frequency-doubler circuits using combinations of transductors and dry cell valves. Publication also describes "frequency tripler circuits using three-phase transformers with saturated core and secondary winding induced by the zero-sequence flux component." To obtain "Bibliography of Technical Reports; March, 1952," remit 50c direct to Office of Technical Services, U.S. Department of Commerce, Washington 25, D.C.

Sectional views show fittings to join plastic pipe

Sixteen-page booklet illustrates fittings for pipe extruded from cellulose acetate butyrate. Introductory page reviews serviceable properties of plastic piping such as corrosion-resistance, light weight, low frictional resistance, etc. Booklet describes fabrication of various fittings from extruded pipe lengths and methods of installing these joints in pipe lines. Discussion also covers molded fittings and special couplings approved for joining plastic to metal pipe.

Diagrams of slip sleeve, bell, and flanged joints are offered as well as "L" and "T" type fittings. Information is intended for oil-field and industrial engineers and others concerned with manufacture or installation of pipe. "Fittings for Pipe Extruded from Tenite" is issued by Tennessee Eastman Company, Dept. CP, Kingsport, Tenn. When inquiring specify CP 2800 on handy form, pages 2 and 3.

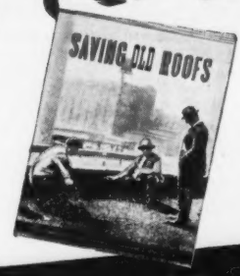
Safe handling of mercury

Eight-page report presents safe and practical guide to users of metallic mercury in connection with industrial instrumentation. Information is offered in six brief sections and includes dimensional illustrations of two metal containers for transporting mercury. Personnel safety is discussed on the basis of poisonous effects to human body. Recommendations are made for safe working conditions proportional to mercury concentrations.

Cast iron or steel are recommended for use in contact with mercury. Glass apparatus may be used where conditions warrant, and with consideration to resulting effects in the event of glass breakage. In process instrumentation, booklet suggests a check on chemical reaction of process fluid with mercury. Process conditions are listed for the combination of mercury with inorganic acids, edible products, photographic film, ammonia, and catalysts.

Safety suggestions are given for cleaning mercury by filtration, oxidation with filtration, and distillation. Three commercial grades of mercury are tabulated according to

FREE!



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This simple system of roof maintenance and repair can save you today's high costs of re-roofing and major repair by outside contractors. Shows how every type of industrial and commercial roof can be maintained at low cost and give many years of extra service. This FREE manual, by word and picture, gives simple step by step methods of inspection and repair . . . tells what to look for and where to look to stop major roof defects *before they start* . . . how to do your own repairs quickly, effectively, economically. Packed with money-saving practical information. A request on your business letterhead brings your FREE copy at once—write today!

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When inquiring check CP 2801 on handy form, pgs. 2-3

percentage of non-volatile, insoluble, and foreign material present. Report makes recommendations as to suitable storage containers and precautions to be taken against spillage. "Mercury Handling" is issued by Instrument Society of America, 1319 Allegheny Ave., Pittsburgh 33, Pa. When inquiring specify CP 2802 on handy form, pages 2 and 3.

Gives information on 1-500 hp mixers for open or closed tanks

Turbine-type electrically powered mixers (1-500 hp) for open and closed tanks, and a discussion of fluid agitation are contained in 32-page illustrated catalog.

Manufacturer's Series "E" mixers shown in the catalog are offered with speeds up to 16 different rpm standard AGMA from one basic gear reducer drive. Other qualities of the series listed are: 1) standardized components (mixers have interchangeable parts), 2) quickly converted from open to closed tank operations, 3) standard stuffing box construction permits operation from full vacuum to 150 psi and at temperatures from 0 to 300°F with modifications available, 4) independent suspension of gear reducer hollow quill and the agitator shaft and separate sets of ball bearings, 5) units are delivered ready to install and run.

Cat B-102 is issued by Mixing Equipment Co., Inc., Dept. CP, 200 Mt. Read Blvd., Rochester 1, N. Y. When inquiring specify CP 2803 on handy form, pages 2 and 3.

Care of electric motors and controls is explained in booklet

General problems of both motors and their controls common to the chemical industry are treated in 35-page booklet. Each of eight sections of the booklet deals with general application problems, such as corrosion, hazardous locations, outdoor service, minimum space and weight, and how-to-get centralized control; shows how the coordinated application of motors and controls provides the solution.

Both internal and external construction details of available motors and controls for various chemical industry applications are described and illustrated by means of cut-aways, sketches, and photographs.

Booklet B-4792 is issued by the Westinghouse Electric Corp., Dept. CP, Box 2099, Pittsburgh 30, Pa. When inquiring specify CP 2804 on handy form, pages 2 and 3.

Steam generator utilizes forced recirculation

Twelve-page booklet describes and illustrates steam generators incorporating forced recirculation principle. Three-color bulletin tabulates specifications of eight models ranging from 10 to 100 hp. Units are oil or gas fired and function at operating pressure of 65 to 150 psi. Single and multiple generators are pictured in various industrial sites. Generators are fully automatic and attain working pressure within five minutes from cold start. Generators maintain a thermal efficiency of 75 to 80% and standby losses are negligible.

Schematic diagram permits rough estimation of generator dimensions for installation. Industrial applications relate to food processing plants, laundries, canneries, cleaners, textile mills, etc. Booklet "Forced Recirculation Steam Generator" is issued by Clayton Manufacturing Co., Dept. CP, El Monte, Calif. When inquiring specify CP 2805 on handy form, pages 2 and 3.

Casey's got control
over bumps and batters!

Casey's the nemesis of the twilight league—he's got his old stuff back—throws 'em in like the big leaguer the scouts say he could be. "Give the boss credit," quips Casey. "His tire replacement program did it. These MONARCH MONO-CUSHION TIRES pussyfoot over the floors, soak up jolts and jars instead of me. Now, I arrive at the ball park shake-free and sure. Don't forget the company wins, too,—with a champ 'ball club' plus big league savings on truck and floor maintenance."

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The leading manufacturers of industrial vehicles, both hand and powered, use Monarch Tires as original equipment. Replacements are available through distributors and manufacturers of your vehicles.

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In twenty-five years, Anti-Corrosive has already passed the *two billion* mark in fastenings of stainless steel! Certainly this is your cue to remember Anti-Corrosive, America's oldest and largest firm dealing *exclusively* in stainless steel fastenings, when your requirements call for screws, nuts, bolts, rivets, pins or any other fastening of stainless steel! And, although most current *production* requires priority ratings, there are millions of items IN STOCK, ready for *immediate delivery*, so check with Anti-Corrosive *first* for your needs!

FREE—A-N Stainless Fastening Selector

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NEW LITERATURE

Photographs, sketches describe 3-dimensional 'scopes

Fourteen models (formerly called Stereoscopic Wide Field Microscopes) and accessories are fully illustrated with photographs and sketches in manufacturer's 20-page brochure.

Three-dimensional feature of these instruments provides a magnified image which is both stereoscopic and unreversed. Other features listed in the brochure include: 1) dust-proof seal in prism housing, 2) dust-proof nosepieces, 3) interchangeable objectives, 4) extra-wide focusing rack for longer life, 5) sliding nosepieces, and 6) rotatable models that swing about the center of the field of view.

Three types of illuminators are described: 1) reflector illuminator with elliptical mirror, 2) fluorescent illuminator which provides cool light of even intensity, and 3) improved Nicholas illuminator which furnishes parallel light.

Brochure of stereomicroscopes is issued by Bausch & Lomb Optical Co., Dept. CP, 635 St. Paul St., Rochester 2, N. Y. When inquiring specify CP 2808 on handy form, pages 2 and 3.

Explains advantages and uses of far infrared heaters

Six-page folder gives thorough description of far infrared heaters which were featured in earlier issue of CHEMICAL PROCESSING. Heat radiates from far infrared portion of spectrum as contrasted to more familiar near infrared radiation. Resulting difference in wave length indicates a variation in radiant properties. Two-color bulletin pictures some of the processing units which are utilizing far infrared radiant heaters. Application of heaters is pertinent to plastic, metal, foundry, and rubber industries.

Interesting feature is that far infrared radiation is absorbed by glass and not transmitted. On the other hand, near infrared is transmitted by glass, and almost wholly reflected by white materials. Far infrared rays are absorbed almost equally by all colors and materials from white to black. Folder itemizes ten advantages of far infrared radiation when applied to industry. In addition to tables of specifications and sectional illustrations, endorsements by users of heating unit are included.

Approximate overall length of heater ranges from 24 to 85″, while heated length range is approximately 17 to 78″. End dimension of unit is 3¾″. Heat output is adjustable from 0 to 100%. Folder CS-604 is issued by Edwin L. Wiegand, Dept. CP, 7517 Thomas Blvd., Pittsburgh 8, Pa. When inquiring specify CP 2809 on handy form, pages 2 and 3.

Complete line of liquid level and water gages

Tubular glass and flat glass liquid level gages are described in 72-page booklet. Tubular type is connected to valves by means of stuffing boxes, while flat glass type is usually attached to valves with rigid screw, union, or flanged connections. Direct reading is possible in pressure vessels, boilers, evaporators, processing tanks, etc. Gages are said to be serviceable where medium may range from subzero temperature to 1000°F, and pressure range from partial vacuum to 10,000 psi.

Physical and chemical properties are summarized for the metallic components of gages. Recommendations are tabulated for various pressures and temperatures at

What's "A New Solution"?

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In each issue you will find specific "case histories" showing how these processing problems were solved.

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☆

which liquid level gages and gage valves will function efficiently. Sectional and cutaway illustrations serve to highlight operating features of gages. Appropriate dimensions are included with these illustrations. Flat glasses are generally recommended on applications requiring additional strength, safety, and ruggedness. According to booklet, these glasses have withstood laboratory non-shock hydrostatic pressures of 15,000 psi.

Cat 35 is issued by Penberthy Injector Company, Dept. CP, 1242 Holden Ave., Detroit 2, Mich. When inquiring specify CP 2810 on handy form, pages 2 and 3.

Oven stops moisture pickup in mineral coated electrodes

Six-page bulletin lists advantages of electrode ovens designed to protect mineral coatings against moisture absorption. Portable and electrically heated oven is intended for care and storage of unpacked coated electrodes at their point of use. Unit operates automatically from 110-220 or 440 v, AC. Variable thermostatic control regulates temperatures to suit any type of coated electrodes. Oven was developed to cater to superior flux coatings, whose efficiency is limited by their susceptability to atmospheric moisture.

Two major sizes of ovens have electrode storing capacities of 350 and 900 lb. Smaller and portable oven stores 12 lb, and dispenses any length electrode up to 18". This light-weight unit is intended for carrying heated electrodes to isolated operations. Illustrations show interior of oven, which includes items such as removable trays, thermostat control, insulation, etc. Temperature may be adjusted from 175 to 550°F. According to bulletin, electrode control stops rod scrap loss, eliminates rework, permits faster welding, and affords safe and efficient storage. Bul DR-2 is issued by Philip Roden Co., Dept. CP, 1721 E. Lake Bluff Blvd., Milwaukee 11, Wis. When inquiring specify CP 2811 on handy form, pages 2 and 3.

Index tags repair jobs for iron cements

Maintenance and repair applications of ten grades of iron cements are summarized in 39-page booklet. Various grades of cement are described according to their appropriate uses, mixing procedure, colors, drying time, etc. Bronze and aluminum cements are offered for filling surface blemishes and rough places in the castings. Approximately 80 different repair jobs are illustrated, and index permits quick location of these maintenance tasks. According to booklet, cements will withstand water, steam, oil, gasoline, fire, and hold under pressure or vacuum.

Methods of mixing and applying cement are discussed briefly. Material is sold in powder form, and quantity of water added will determine stiffness or softness of putty. Two other items discussed in booklet are gaskets and clamps coated with cement. Soft coating flows over face of gasket and flange, filling all uneven places. Gaskets are intended for flanged joints at any pressure or temperature. Clamps are said to be effective on oil or ammonia lines, at threaded pipe fittings, flanged connections, and valves.

"Smooth-On Cements" is issued by Smooth-On Mfg. Co., Dept. CP, 568-574 Communipaw Ave., Jersey City 4, N. J. When inquiring specify CP 2812 on handy form, pages 2 and 3.

There's No Other Welding Tee Like This!
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STAINLESS STEEL, MONEL, NICKEL and INCONEL WELDING FITTINGS
Preferred for Dependable Corrosion Service
The Welding Fittings organization — recognizing the superiority of welded piping for corrosion service—was the first to standardize, manufacture, and stock a complete line of stainless steel welding fittings.
The tee shown above—typical of all FLOWLINE Welding Fittings—provides unique features that have been developed through long, intensive specialization in design and production of welding fittings for corrosion service.
FLOWLINE fittings—tees, ells, reducers, stub ends, and caps—are available in sizes ½" through 12", and in various pipe schedules.
Features of FLOWLINE Tees
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• Heat number permanently stamped on each tee as record of actual analysis and physical properties.
• Every tee is marked with type of metal, size, schedule, wall thickness, and FLOWLINE trade mark.
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World's Largest Manufacturer of Stainless Welding Fittings

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Heat-Transfer Surface

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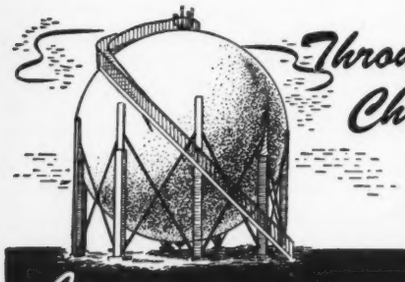
You are assured of high efficiency in heating or cooling – long service life – low maintenance and service costs, when you specify Aerofin extended-surface heat exchangers.

The reason is obvious: Aerofin makes heat exchangers *exclusively* — offers you the results of unequalled experience, unequalled production facilities, unequalled materials testing and design research — and the guidance of a complete, highly skilled engineering staff, at the plant and in the field.

For the most practical solution to your heat-exchange problem, ASK THE AEROFIN MAN.



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NEW LITERATURE

Booklet serves as equipment guide for foundry and sand testing

Equipment and instruments for testing foundry sands, bonds, and coating materials are described in 94-page booklet. First section of booklet describes units designed for obtaining test data at room temperatures. This information is used in controlling the molding properties of sand. Specifications and illustrations are offered for pyrometers, compression instruments, permeability meters, moisture indicators, desiccators, and many others. Accessory items such as balances, drying dishes, graduates, and sand testing sieves are described.

Second portion of booklet is devoted to equipment for gathering high temperature test data. This information is required to determine physical properties of sand at time of pouring, solidification, cooling and shake out of the casting. In high temperature testing field, equipment is used to determine refractoriness, strength, rate of collapsibility, degree of spalling, and gas pressure. Among several instruments described is sinter meter for measuring refractoriness of sands, clays, cores etc.

Highlight of booklet's second section is thermolab for testing molding and refractory materials with hydraulic loading and dead-weight load measuring system. Fifteen properties are listed which may be determined by this unit. Thermolab has normal operating range from room temperature to 2750°F, and may function for short periods at temperatures up to 3000°F. Booklet also offers series of 18 photographs showing different casting defects. Concluding feature is casting quality chart, which outlines characteristics of 14 casting defects.

"Tools for Control" is issued by Harry W. Dietert Co., Dept. CP, 9330 Roselawn Ave., Detroit 4, Mich. When inquiring specify CP 2815 on handy form, pages 2 and 3.

Offers breakdown review of 20-700 hp motors

Twenty-page booklet describes AC induction motors which range from 20 to 700 hp. Basic features of the motors are illustrated sectionally. Two-color catalog reviews motor construction in what amounts to a pictorial breakdown. Separate sections of booklet discuss steel frames, end brackets, stator design, and rotors. Three types of bearings incorporated in various motors are pre-lubricated sealed, sealed-sleeve, and standard ball bearings. Path of controlled ventilation through motor is pictured.

Booklet B-4731 is issued by Westinghouse Electric Corporation, Dept. CP, Box 2099, Pittsburgh 30, Pa. When inquiring specify CP 2816 on handy form, pages 2 and 3.

Over 90 illustrations show skids, hand trucks, trailers, wheels

Twelve-page bulletin offers complete line of hand trucks, trailers, and other equipment for moving materials. In addition to these pieces, several skids, dollies, wheels, and casters are shown in approximately 90 separate illustrations. Dimensions are included for various items as well as determined capacities. Construction features of hand truck are indicated in separate section of bulletin. Cutaway view of wheel and caster shows construction highlights.

Rubber-tired wheels vary in wheel size from 4 x 1½ to 18 x 3". Load capacity of these tires ranges from 170 to 1290 lb. Crown-face, semi-steel wheels are also offered as standard equipment. Form 508-B is issued by The Howe Scale Company, Dept. CP, Rutland, Vt. When inquiring specify CP 2817 on handy form, pages 2 and 3.

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PLA-TANK®

Resin-Bonded Fiberglas® PIPE

Sizes 2" to 12", incl.

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Elbows, Tees — all the fittings you need for sizes 2" to 12" pipe.

IMMEDIATE SHIPMENTS

from completely equipped plant now in full production.

DUCTS

Standard sizes 6"-48".

Hoods and rectangular shapes to order.

PLA-TANK supplies the answer to many problems involving transfers of corrosive liquids or gases. Made of Fiberglas, impregnated and bonded with polyester resin, it is molded into strong, rigid units — units that will be resistant at temperatures from −60°F. to +280°F. Pipe joints are easily made right on the job with PLA-TANK Fittings and "paint brush welds." Competitively priced, its long life proved in service, PLA-TANK is immediately available to meet your needs.

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THE Chemical CORPORATION

63 Waltham Avenue Springfield 9, Mass.

When inquiring check CP 2818 on handy form pgs. 2-3

Methods of Training Supervisors

(*Continued from page 4*)

To correct this failing, supervisors must first see what is wrong with the things they are doing now. They must recognize what effect their wrong actions have on the people they work with. They must recognize for themselves the reasons why their behavior needs changing. Next there must be a desire to change. This requires a conviction that there will be personal gain in improved human relations.

Finally, supervisors must have the ability to change. This means that they should have opportunity away from the job to practice the skills involved in handling people. The supervisor needs a chance to make mistakes, to recognize his mistakes when they are made, and an opportunity to practice until he is confident enough to use his new skill with assurance on the job.

Two new developments in training have provided a double-barreled approach that can help solve our supervisory problems. These new training tools are the case study method and role playing. In my own company, we use them as a training team that will do a job in developing human relations skills.

Both the case method and role playing make use of the pressure of group censorship to accomplish changes in attitude and action. We are all very much aware of this kind of group pressure. It is the psychological influence that governs the thinking and decision of a jury. In a plant situation, if a group member can be encouraged to think out loud, and there is confidence to criticize among the members participating, the group censorship quickly becomes a potent force for personal development. The case method makes use of this force by presenting an actual case to the group. Through group discussion, the objective is first to change supervisors in the way they look at their relationships with other people on the job. In other words, to change attitudes.

However, a change in attitude and thinking does not necessarily result in a change to the right kind of action. The role playing technique serves to translate this changed thinking into action. It gives the supervisor a chance to act out the role he would play — before he goes on the job. With the group as an audience, and other members playing secondary parts in the case, the supervisor has an opportunity to practice the approach he should take. Every mistake he makes is submitted to the censorship of the group. Since everybody goes through the role, nobody's feelings are hurt. In this way, role playing helps the supervisor to implement his changed attitudes when he goes back to the job.

Training can take its place as an operating responsibility of the line organization only if all levels of the supervisory group are capable of handling that part of the training job which is assigned to them. This first involves an understanding on the part of the higher levels of supervision that their own success depends, to a degree, upon the development of the people who report to them. One of the best ways for the superintendent or general foreman to assure himself an opportunity to move ahead is to develop a replacement who is capable of filling his shoes on short notice. All this calls for some practical method of training supervisors as trainers.

To do this in our own program, we have set as our objective the training of all supervisors in the skills of conference leadership. We feel that a trained conference leader is not only a better leader, he is also a better participant and follower. This holds true whether he is a member of a case study group or is participating in a plant production conference. We feel that the group conference is a simple

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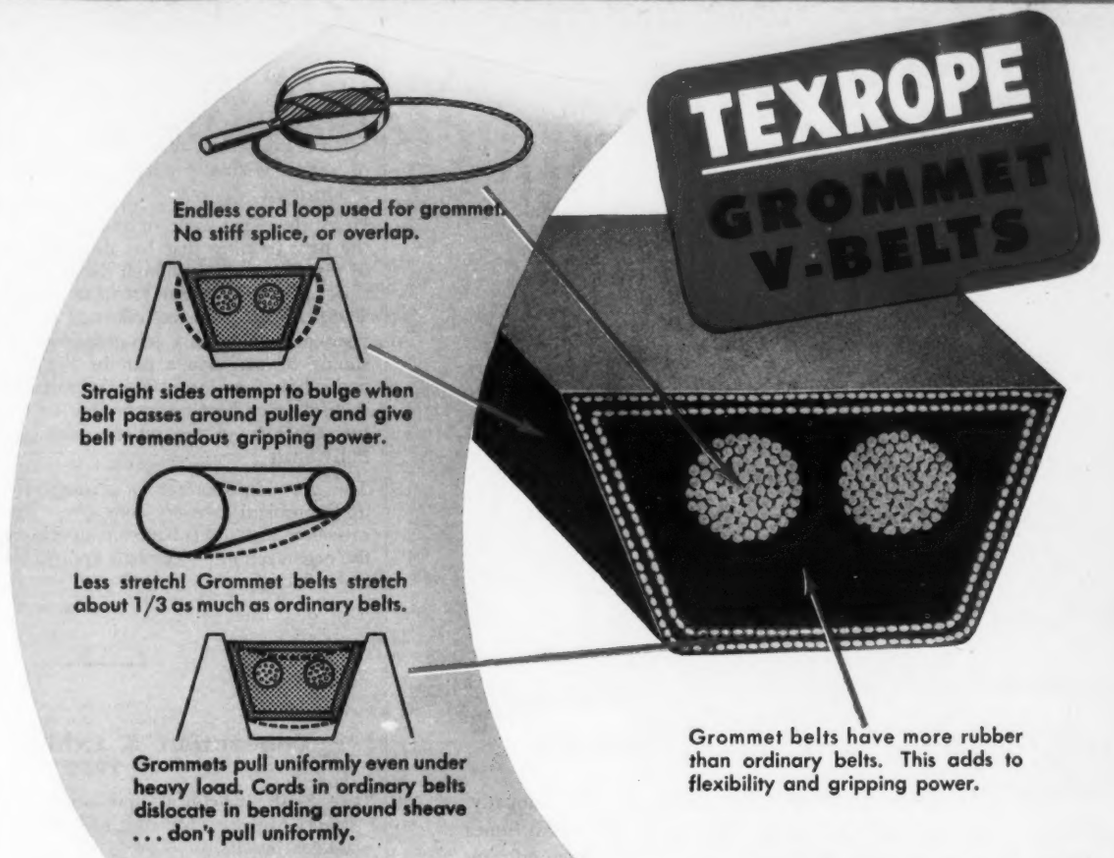
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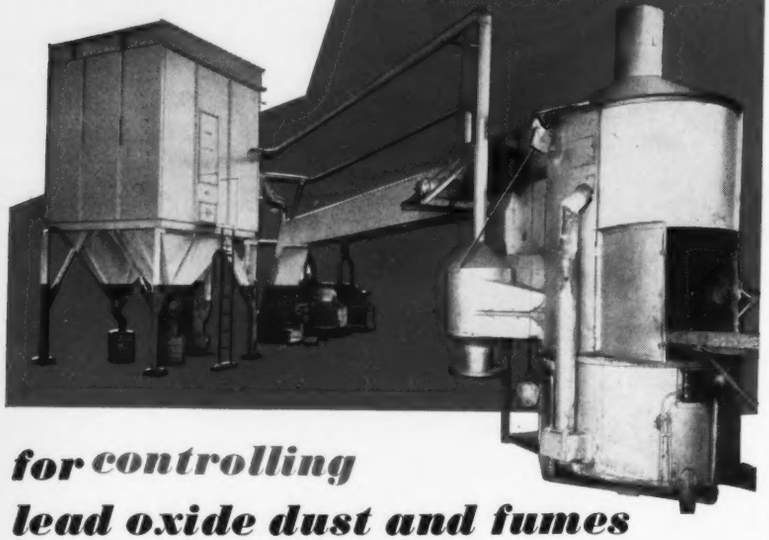

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(*Continued from preceding page*)

method of getting people together to pool their ideas and experiences in the discussion or solution of common problems. This course trains people in the fundamentals of logical thinking. It trains them to attack a group problem in an organized, systematic fashion so that a definite course of action is finally agreed upon and carried out by the group itself.

Here, then, are some of the outstanding characteristics of the new training that has developed in the United States in recent years. Although the techniques may change, the basic principles seem to have considerable permanence. Training that is to pay off must be accepted by the supervisor as part of his job responsibilities. Good training should be as much a part of the supervisor's tool kit as good housekeeping. The importance of the individual should never become secondary to the group in training, for effective group action must spring from effective individuals.

The growing shortage of management manpower points up a problem to every company. Properly used, training may become a useful tool in developing men from within the organization — the best approach in terms of economy and effectiveness.

Convention & Exhibit Schedule 1952

June 8-10. Chemical Specialties Manufacturers Association, Midyear Meeting, Copley-Plaza Hotel, Boston, Massachusetts.

June 16-18. National Fertilizer Association, Annual Meeting, Greenbrier Hotel, White Sulphur Springs, W. Va.

June 23-25. Manufacturing Chemists Association, Greenbrier Hotel, White Sulphur Springs, W. Va.

June 23-25. Synthetic Organic Chemical Manufacturers Association, Greenbrier Hotel, White Sulphur Springs, W. Va.

Aug. 12-14. 4th Western Packaging and Materials Handling Exposition, Shrine Convention Hall, Los Angeles, California.

Sept. 8-12. Instrument Society of America, National Instrument Conference and Exhibit, Cleveland, Ohio.

Sept. 9-13. American Chemical Society, Chicago Section, Seventh National Chemical Exposition, Chicago Coliseum, Chicago, Ill.

Sept. 11-13. American Institute of Chemical Engineers, Palmer House, Chicago, Ill.

Oct. 14-16. The Society of Industrial Packaging and Materials Handling Engineers, 7th Annual Exposition, Chicago Coliseum, Chicago, Ill.

Oct. 20-21. National Association of Suggestion Systems, 10th Annual Convention, Drake Hotel, Chicago, Ill.

Nov. 17-19. National Paint, Varnish and Lacquer Association, Annual Convention, Palmer House, Chicago, Illinois.

Nov. 20-22. Federation of Paint and Varnish Production Clubs, Annual Meeting, Palmer House, Chicago, Ill.

Dec. 7-10. American Institute of Chemical Engineers, Annual Meeting, Hotel Cleveland (headquarters) and Carter Hotel, Cleveland, Ohio.

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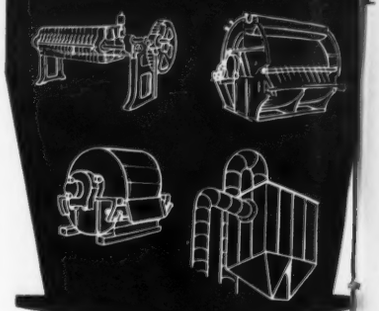

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Discussed in This Issue---
PROCESSES, EQUIPMENT *and* MATERIALS

Use this "quick-locator" when you want information on a specific type of process, equipment or material mentioned in the processing stories or the advertisements in this magazine. Everything discussed in this issue is given here, if you want more data you can write manufacturer direct . . . or turn to pages 2 and 3 and use the handy "Information Request Slip." This is a special service provided by the publisher . . . no obligation or charge, of course. The publisher contacts the proper manufacturers for you—information comes to you direct.

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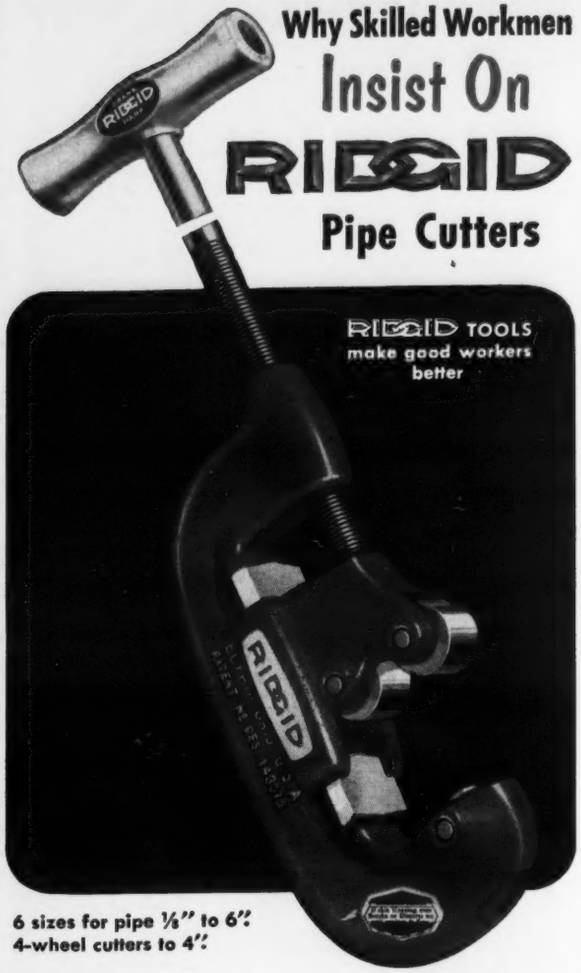

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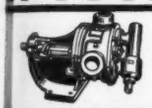

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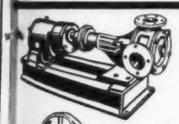

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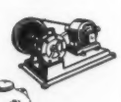

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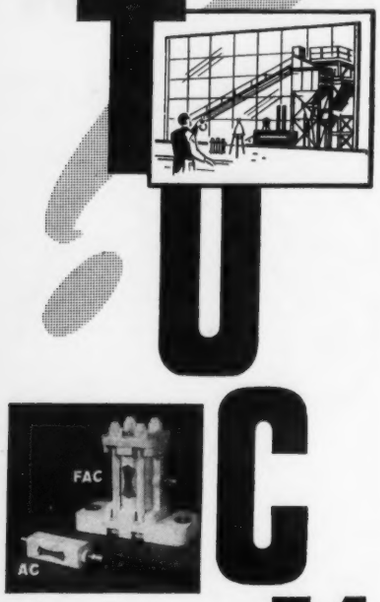

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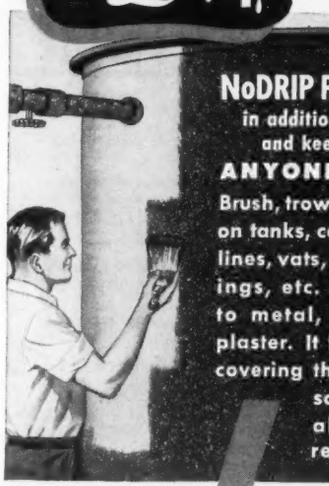

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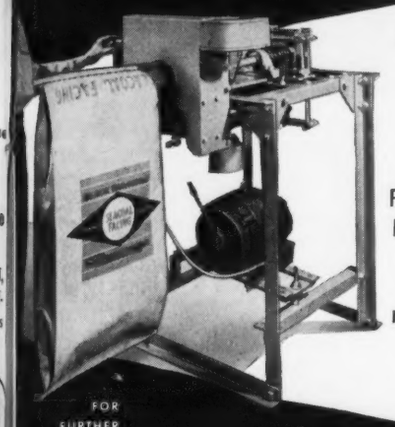

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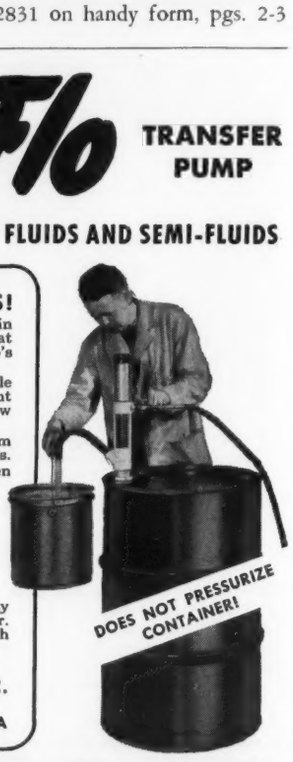

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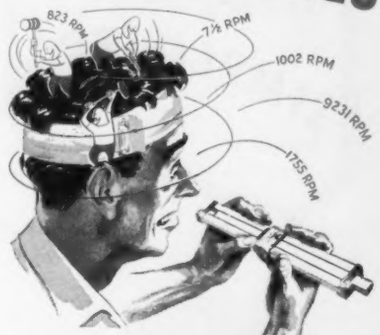

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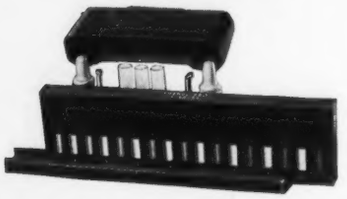

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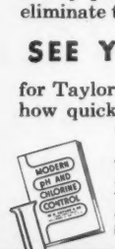

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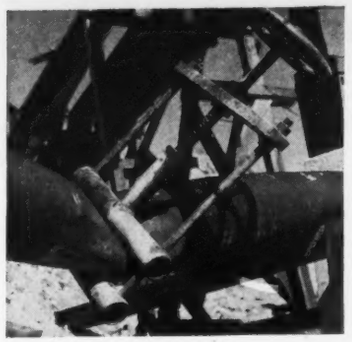

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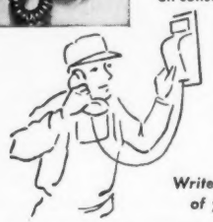

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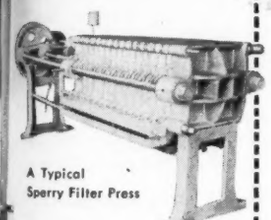

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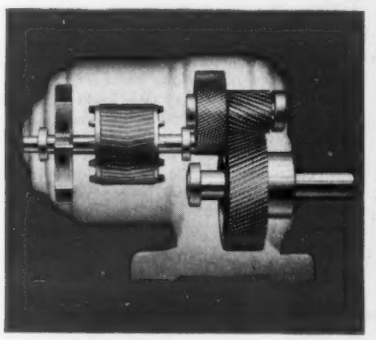

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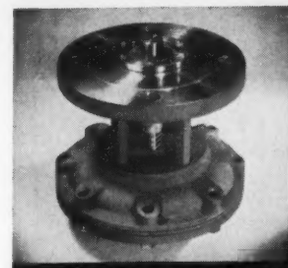

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Patented treatment reduces ash in petroleum residuals

A glycerine treatment has been patented which reduces ash in petroleum residuals. A residual product results from the treatment of reduced crude oil with caustic soda, prior to removing lubricating oil fractions by vacuum distillation. High ash content (2-3%) limits its usefulness as fuel. However, the residual can be de-ashed by mixing a small amount of glycerine with the oil, then neutralizing the alkaline naphthenates with concentrated sulfuric acid and vaporizing the water from the mixture. The glycerine causes the inorganic salt remaining to have a coarse crystal structure, easily filtered, in place of the emulsion-forming tendency usual after neutralization. U. S. Patent No. 2,545,806.

Spend money like H_2O

Families with highest income use the most water, reports the water survey division of Illinois. Study shows that families with a $6000 annual income use 5 times as much water as those with $2500.

Terpene hydroperoxides as catalysts

United States Department of Agriculture says that natural scientists have found chemicals in turpentine which show promise for use in preparation of synthetic rubber, plastics, and other products. These chemicals — terpene hydroperoxides — are particularly suited for use as catalysts in speeding output of cold rubber. The Department indicated that commercial production of these new chemicals would open new markets to the gum naval stores industry. Benzene and other critical materials might be conserved.

Tin cans and copper

For over 35 years producers have used shredded tin cans in recovering copper from run-off water in and about mines. Because of a growing shortage of tin cans, NPA issued order M-98, directing flow of used tin cans to shredding plants where they are prepared for use in producing copper from this source. One ton of copper can be obtained by precipitation from one and one-quarter tons of shredded cans. Order applies only to certain counties in California and Arizona.

Vacuum process applies aluminum film 0.000005" thick to toy pistols

A vacuum process is used to apply an aluminum film to new model toy pistols and provide a permanent "shine" that will make any youngster proud of his shootin' iron. It takes less than ¼ oz of aluminum snippings to coat 216 pistols with an aluminum film 0.000005" thick. (Kaiser Aluminum News.)

Display sign is made like a sandwich — we'd call it "decal on Vinylite"

Display signs that can be attached to windows in a few seconds, and removed just as quickly, are composed of decals sealed between two layers of clear Vinylite plastic. The tough material strongly resists tearing, abrasion, mold, mildew, grease and most chemicals. Signs are mounted by wetting window with water. Sign is placed over wetted surface and excess water removed with squeegee. Sign adheres through all types of temperature change.

All about blue notes and those of other colors

A survey among 148 college students revealed that 39% were able to "see" colors while listening to music. Sir Isaac Newton long ago related colors to the diatonic scale in this manner: Do, red; Re, orange; Mi, yellow; Fa, green; Sol, blue; La, indigo; and Ti, violet. (Dyelines & Bylines)

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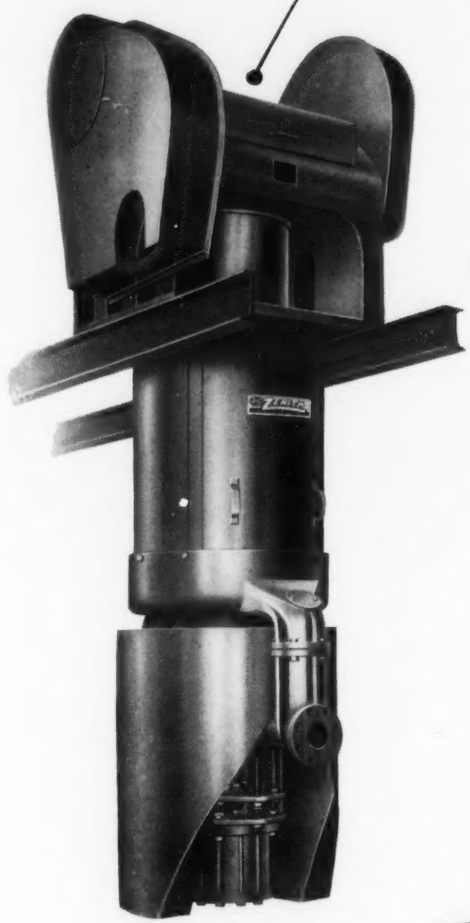

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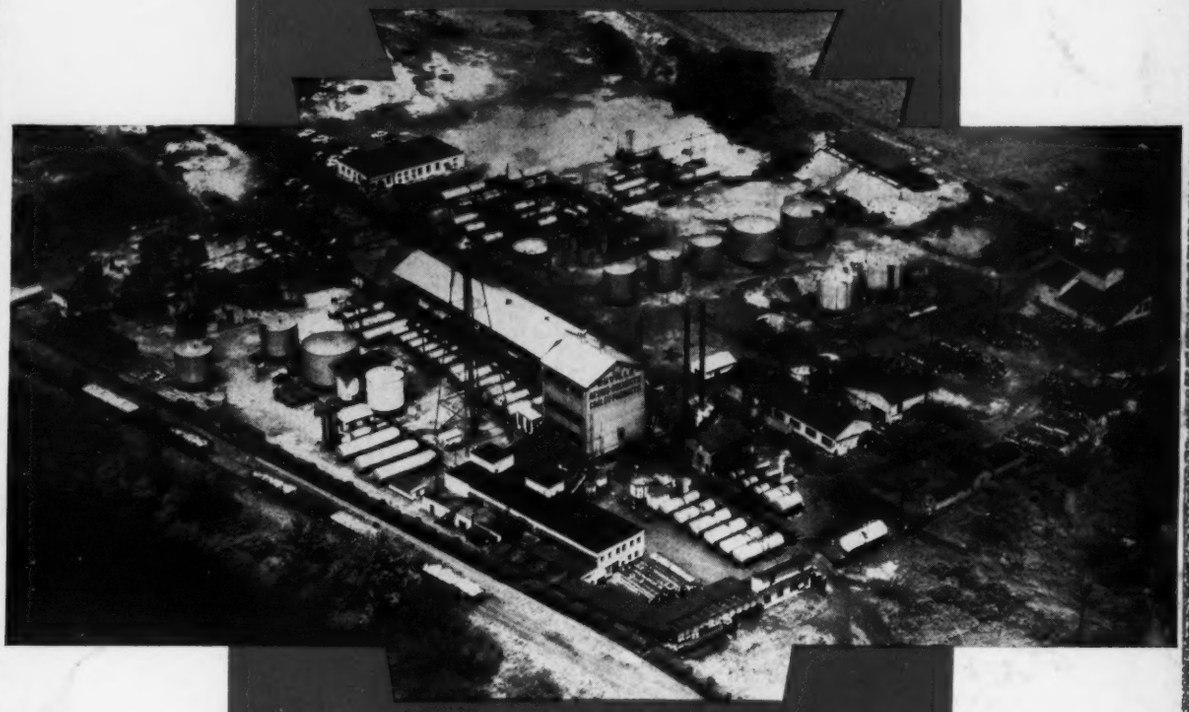

Partial view of plant at Neville Island, on the Ohio River, 8 miles west of Pittsburgh, Pa., showing main resin manufacturing and solvent refining units.

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